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A NEW OPERATION FOR THE CURE OF LAMENESS ARISING FROM SIDE-BONES.

BY FRED SMITH, PROFESSOR, ARMY VETERINARY SCHOOL, ALDERSHOT.

In a lecture I recently delivered before the Southern Counties Veterinary Association on the "Rational Treatment of some Diseases of the Limbs," I was tempted to give publicity to an operation I first performed four years ago for the cure of lameness resulting from Side-bones. It was not originally my intention of making the operation public until I had tried it in every way and thoroughly tested its value; but after the long period of four years, during two of which I have been relieved from active professional practice, I felt that delay was unwise, as I had already collected sufficient material to strengthen my hands, and to justify me in advising the operation.

I take it that the lameness in Side-bones is due to the pressure exerted on the sensitive laminæ by the enlarged and rigid cartilage on the one hand, and the unyielding wall on the other.* It occurred to me that if this was the case, the lameness could be removed if I relieved the laminæ from pressure, and the foot from tension, by making such incisions into the horny wall of the foot as would permit it to bulge, or, at any rate, would permit the enlarging cartilage to be accommodated without pressure on the delicate and sensitive parts covering it. This is the *rationale* of the operation which I first performed on horse E 30, 12th Royal Lancers, on 4th October, 1883.

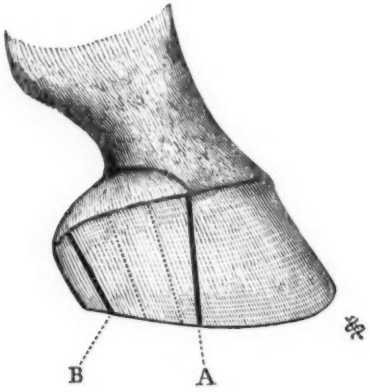
There is an old and very true saying that "there is nothing new under the sun"; such appears to be the case in the present instance,

* I have heard lately that it has been stated that the sensitive laminæ *do not* cover the lateral cartilages of the foot. I can only refer those who doubt the truth of the statement to a dissection of the foot.

for Mr. Duck and I saw the other day at Alfort, a horse's foot cut with a drawing-knife in much the same way as I advocate being done with a saw; being performed over the seat of Side-bones, we inferred it was done for the relief of this disease.

I may now go a step further, and will say that an operation based on the same principles as the above is clearly indicated in certain cases of Laminitis to prevent "dropping of the pedal bone."

I believe that there is a great future in store for mechanical treatment of certain diseases of the feet, and I have elsewhere strongly expressed myself that the specimens of mutilated feet, the result of acute Laminitis, which adorn the shelves of our museums,



will, in a future generation of practitioners, be regarded as a silent testimony of our ignorance, for I am convinced that such cases are *preventible* by early operation.

To return, however, to the subject of Side-bones. As soon as I am satisfied that I have a case of lameness due to ossification or partial ossification of the lateral cartilage, I prepare to relieve the sensitive laminæ from pressure, *and to increase the size of the foot* for the accommodation of the gradually enlarging cartilage. This is accomplished by sawing through the wall of the foot in two or more places, until I have passed through its entire thickness, from the coronary band to the ground surface, taking care that I go no deeper than the outside of the horny laminæ.

For Side-bones, the part of the wall operated upon is, of course, the quarters and heels. I note how far forward the cartilage can

be felt, and I mark the wall at this spot with a piece of chalk; the same is done in a backward direction towards the heels; from my anterior chalk mark, I draw a nearly vertical line from the coronet to the ground; from my posterior mark I draw a line obliquely downwards and forwards, so as to strike the ground surface of the foot just before where the wall is inflected to form the bars. (See Fig.) It is obvious that if I now cut with a saw through the marks drawn until I get through the whole thickness of the wall, that I shall have isolated the greater part of the quarters and heels of the foot; but the isolation would not be complete, for I still have the wall attached to the sole; this union is severed by means of the drawing-knife, a fine searcher being used and the wall completely isolated from the sole (between the anterior and posterior incisions), until specks of blood commence to appear. If both sides of the foot require operating on, the same directions apply.

The next thing to do is to place on a bar shoe with no bearing on the operated quarters and heels, the shoe resting upon the frog and anterior portion of the foot; the fine cuts made in the wall are filled in with a little wax or hard soap to keep out the dirt, and with the same object a little tar and tow is placed in the groove between the wall and sole, and kept in its place by the shoe. The horse may be rested for a day or two and then sent to exercise, which latter is an essential part of the treatment; this exercise to commence with should be walking, and if a saddle-horse, trotting may be permitted the second or third week; if a horse used for slow draught purposes, he may be sent to work almost at once.

In favourable cases soundness is restored in a few weeks—usually, so far as I can see, in about three or four, though some cases are of course longer than this. It will now be observed that the new wall growing down bulges at the coronet; it is larger than the old wall; in other words, the operation has relieved the cartilage from pressure, allowed it to enlarge, and caused the wall to accommodate itself to the increased size obtained. This bulging of the coronet is most marked, and is a very striking feature. It tells its own tale in a silent but practical manner.

As the result of a certain amount of experience in the operation, I would lay down the following as a guide to its performance.

Mark on the wall of the foot (while the latter is on the ground) the distance forward that the enlarged cartilage can be felt, and from this point draw a vertical line to the ground so as to cut the fibres, not in the direction of their length, but crosswise; the object of this is to secure as much foot as possible to nail to; next mark the posterior extremity of the cartilage, and this time draw a line in the direction of the fibres, to terminate on the wall just in

front of the inflection of the heel; between the anterior and posterior incisions other sections may be made, if considered necessary, so as to further release the wall. This was suggested to me by Mr. Poyser, A.V.D., and I have tried it in two cases; it is yet too early to pass an opinion as to whether these secondary incisions are advantageous. The foot is now ready for operation, the shoe being removed, and no means of restraint employed, as the procedure is quite painless: with a short sharp saw, kept well oiled, the wall is cut through; the most difficult part to manage is the upper portion, near the coronet, as the latter is liable to be touched by the teeth of the saw. Try and saw perfectly level, so as to cut the wall the same depth throughout; as we get deeper the instrument must be worked with a lighter hand, and at the *first sign of flinching*, withdraw it at once; proceed, then, with the next incision in exactly the same way. The foot all this time is held up by an assistant close to the elbow in order to steady it; it is now placed between the knees, and, with a fine searcher, the wall is gradually separated from the sole by a narrow groove between the anterior and posterior incisions, until specks of blood appear, or the animal commences to flinch, when the operation is completed so far as that half of the foot is concerned. A bar shoe is now applied and the bearing taken off the loosened wall, which by this time should easily spring under the pressure of the thumb; if it does not so spring, the incisions are either not deep enough or long enough, and the operation will surely fail. To prevent dirt getting into the incisions, fill them in with hard soap; and now a peculiar fact will be seen: suppose that all the incisions are carefully filled in flush with the wall, and the horse is then made to trot, it will be found on again looking at the foot, that the soap from most of the incisions, particularly the rear ones, *has been squeezed out*, or partly so, caused, I take it, by the expansion of the foot bringing the sides of the incisions together. Another demonstration of the expansion of the foot is afforded by the fact that an incision made in the wall when the foot is off the ground, which will admit of the saw working freely, will, when the weight is on the limb, "grip" the saw, and it cannot be worked. I am perfectly aware that my deductions will not be accepted by many, but the experimental facts still remain.

About a fortnight or three weeks after the operation, it may be necessary to deepen the incisions, as they soon come together, especially towards the inferior part of the wall, and, moreover, they appear to fill up from below and become shallower.

One of the principal parts of the treatment is to keep the patient either at work or exercise.

For a day or two after the operation the lameness may appear

more marked, but this is only to be expected; it will soon pass off. Later it may be observed that the coronet is gradually bulging over the Side-bone, and the wall will grow down with this bulge, which may be accepted as a most satisfactory result. The extent of the bulging may be known by measurement, both before and a week or two after the operation. I have lately heard of a case where the coronet enlarged no less than 2 inches four weeks after the operation, and the horse went sound.

There is no drug, operation, or line of treatment I know of which is infallible. The operation described must not be expected to succeed in every case, for we know that many forms of this lameness are complicated by other changes occurring in the foot; deposits on the plantar surface of the pedal bone, mechanical interference with the structures in the centre of the foot, etc., are unrelieved by external operation, and, in fact, are only alleviated by the entire deprivation of sensation by the operation of neurectomy. I know full well that this side-bone operation will be condemned by many practitioners who have never tried it, and by others who have tried it *once* and failed to obtain benefit. I can only say to the latter, try it again and again, until either satisfactory or unsatisfactory results are obtained, before passing an opinion.

In the early part of this communication I referred to the treatment of acute Laminitis by the operation of incising the wall of the foot, to prevent the descent of the pedal bone. The part operated upon should be that portion of the wall situated between the quarters of the foot. The depth of the incisions should be down to the horny laminæ, the length of them from the coronet to the ground surface, and, lastly, the wall to be separated from the sole between the incisions. By this operation tension is removed, the pressure on the pedal bone (arising from the throwing out of serum and the swelling of the sensitive laminæ) is entirely prevented, and the *wall* of the foot bulges instead of the *sole*.

At what period of the disease is this operation indicated?

My answer is, between the third and fifth days of the attack, when we find the disease is not yielding to treatment, and when we know that the separation of the horny from the sensitive laminæ is occurring, a condition which will ultimately end in disorganization of the foot; I would advise operation even earlier than the period named, if we find that blood or serum is oozing from the coronet.

I am arranging an instrument to facilitate sawing through the wall.

In concluding this notice I append the opinion of two veterinary surgeons who have lately tried the side-bone operation.

Mr. Savage, V.S., A.V.D., 5th Lancers, writes to me as follows: "I performed your operation for Side-bones, affecting both fore feet, on troop horse H 21. Previous to the operation she had been lame on and off for months, latterly intolerably so; the usual treatment was adopted, but without success.

"On the 9th August both fore feet inside and out were operated upon; the mare went to her duty sound on the 8th September, the feet having enlarged considerably at the coronet—as much as two inches. I have unfortunately lost sight of the case, as she was cast for roaring. I am most favourably impressed with the value of the operation, and shall practise it in the future."

Assistant Professor Rutherford, Army Veterinary School, affords me the following observations respecting his experience of the operation. Captain G——'s bay cob gelding, seven years old, was operated on for Side-bones, both fore, inside and out, on the 12th August. At the time of operation the circumference of the upper part of the hoof was 11½ inches near fore, and 11¼ inches off fore. On the 24th October the cob was discharged cured. The hoofs now measured—near fore 13¼ inches, off fore 13¼ inches.

Troop horse C 6, nine years old, operated on for Side-bones, both fore. The circumference of the upper part of both feet was 12¼ inches. The operation was performed on the 26th August, and on 5th September the case was discharged cured. The feet now measured 13½ inches in circumference. "C 6 especially pleased me; he had not been going sound for two years."

TRAUMATIC PERICARDITIS.

BY HAROLD LEENEY, M.R.C.V.S., EAST GRINSTEAD.

THE case of "Traumatic Pericarditis," communicated by Mr. J. R. Green, is interesting, if only from the able manner in which he records it. But I venture to think such cases are by no means rare, as three very similar ones have occurred in my practice in about two years.

The first was a steer, the property of Lord Dunsany. It refused food, and kept standing for a week; no cough, no hurried respiration, and, in fact, a total absence of all symptoms beyond the failure of appetite and rumination. Percussion on the left side indicated a large dull area, which I diagnosed as an abscess. Gave a cordial dose or two, and was sent for after dark to make a *post-mortem* examination, as the bullock was found dead, resting on his sternum in a most comfortable-looking attitude. I had previously marked out the affected area, and at

night, with only a candle, satisfied myself by cutting out two ribs, and coming down on an abscess containing more than a gallon of fluid. The next day the cowman brought me a piece of fencing-wire, about five inches long and much blackened; he had found it imbedded in "the bottom of the bag"—the cyst which I had examined. Wire-fencing had been recently put up, and the other cut ends of it were still to be found.

The next case was at Imberhorne Manor (E. Blount, Esq., C.B.), and occurred not long after the other. I was bold enough to give an opinion that a piece of wire or nail was the cause. This animal (a cow) stood for ten days without any special symptoms, except that auscultation failed to detect any heart-sounds at all. At times I imagined a sound like a muffled drum, but could make nothing definite of it. I have noticed the same kind of thing in Splenic Fever. I can only describe it as a muddled sound—no "lub" "dub," but a sort of fluttering impulse. This cow dropped dead without any warning, and on *post-mortem* examination, the pericardium was found distended to the size of a stable bucket, and the heart was imbedded in it, with just that same appearance of "petrified sponge" to which Mr. Green so admirably compares it. On examination of the wire, it proved to have belonged to a publican's beer-can, and had a little piece of tin adhering to it. This could easily be accounted for, as large quantities of London dung had been brought by train and spread upon the land.

The third case (also a cow) had been suffering from Parturient Apoplexy, and made a rapid recovery, when, a week after, violent palpitation of the heart ensued, which was not allayed by large doses of Digitalis. She dropped dead, like the others. *Post-mortem* examination revealed a nail (one of those commonly called "French nails"), lodged in the pericardium; but the rumen and the liver, as well as diaphragm, were literally riddled with the number of passages this body had evidently made; and yet the cow had never been observed to suffer in any way.

PARALYSIS OF TAIL AND RECTUM FROM FRACTURE OF SACRUM AND COCCYX.

BY S. M. WILSON, FIRST CLASS VETERINARY SURGEON, A.V.D., ALDERSHOT.

Bay gelding, troop horse of H Battery, 2nd Brigade Royal Artillery, stationed at Sheffield. March 1st, 1887, was admitted for contusion. The injury was just above the root of the tail. Cause unknown, supposed to have slipped up in the stable. The

horse was quite unable to raise his tail. If the tail was raised great pain was evinced. No swelling, but great pain on pressure over the spine, about two inches above the root of the tail, and the horse seemed very much afraid when approached. It is, of course, possible the injury may have been the result of a blow. The horse had great difficulty in urinating, and assistance was required in voiding fæces. Applied blister (℞. Hyd. Biniod. Rub. ʒj, Cantharides pulv. ʒj, adeps ʒij) from root of tail, forwards about twelve inches, and about the same width. Gave occasional enemas. Mash diet; nitrate of potass occasionally in the water. During the month of March I became convinced there was a fracture, and I thought it was most probably the first coccygeal vertebra.

My next entry was March 29th. No power whatever to raise the tail or void fæces; still great pain and difficulty in urinating. Paralysis of sphincter ani. Feeds well. Mr. Cartledge, F.R.C.V.S., Sheffield, very kindly looked at the case with me, and concurred in my opinion that there was a fracture.

April 11th. Voided fæces somewhat better, though still requiring considerable assistance. There was always an accumulation in the rectum. Still showed great pain in urinating. Tail perfectly paralysed. No sensation whatever behind the seat of injury. The horse was recommended for casting, but as it was of course unfit for sale was destroyed on the 15th April.

April 15th. *Post-mortem* examination revealed a fracture of the fourth superior spinous process of the sacrum; also fracture of the posterior articular surface (inferiorly) of the first coccygeal vertebra. Muscles round seat of injury very pale.

RECOLLECTIONS OF PRACTICE, OLD AND NEW.

BY W. COX, M.R.C.V.S., NEWCASTLE-ON-TYNE.

Flooding after Parturition.—Cases of P.P. Hæmorrhage are not very common, and during more than twenty years of very extensive practice in a large breeding district, I cannot call to mind more than as many cases. These were in both mares and cows, in the relative proportion of six to four, and, considering the lesser number of brood animals in the first as compared with the latter, the number is much larger. Almost all were in *unassisted* deliveries, that is to say, manual exploration had not been resorted to. It was notable that in all the cases parturition was effected standing.

A client, Mr. Frost, noted in the district for his breed of hire horses, had a valuable mare exhibiting signs of foaling; she had

had foals previously, and was notoriously averse to effecting their expulsion in the stable or whilst the attendants were near. She was consequently turned into an adjacent paddock, and occasionally looked at. After lying down and rising several times, she expelled the foal whilst standing, the fœtal membranes following in a few minutes; she was then left with the foal for a short time, and on the next visit it was found that she was voiding blood in very considerable volume during the throes; a clot was first expelled, and then fluid blood "as if out of a pump spout," this occurring at intervals. This condition of things very naturally alarmed the owner, and my aid was sought. I found the case as just stated, and I am within bounds when I say that upwards of thirty pounds of blood had been lost. The animal was staggering about, the eyes were bright and anxious, the visible mucous membranes were pallid, sighing was frequent, and the pulse feeble and indistinct.

Even before I commenced my examination I had despatched the men around her for as many buckets of cold water as they could bring, and on their arrival I dashed them with considerable force over the patient, especially over the region of the heart. In the meantime I had obtained two large linen bed-sheets, which I soaked in cold water, and then twisted them spirally, and introduced them as far as I could reach into the uterus, leaving the outer ends projecting externally. The mare was held quietly in hand for an hour, and then slowly moved into a loose box, and an attendant told off to keep her standing, and to supply her with food, everything being cold.

A dose of Plumbi acetas, ʒjss, was given, to be repeated in four hours if bleeding recommenced, and at night, to counteract the astringent action of the hæmorrhage and of the lead, a dose of physic was administered. When visited at night she was decidedly better; the loose ends of the sheets were then fastened to the tail, so as to allow of passage for the urine.

Next morning the improvement was still more marked, and several gentle twists were given to the sheets without return of the bleeding. Night visit: feeding well and continued improvement; she was now allowed to be alone for several hours at a time, and was down and resting twice during the night without untoward result.

On the fourth visit, the morning of the third day, on twisting the cloths the mare with a very slight effort expelled them, accompanied with a considerable amount of lochia.

Although the animal was watched, I was careful, after the first night, that she should not be disturbed, considering that rest was indispensable for recuperation, so as to avoid hectic or liability to absorption. Although greatly reduced in condition, she was at

light work in under three weeks, suckled her foal, and subsequently bred several without any casualty.

Mr. Booth, residing near, sent in haste; he had a cow "bleeding to death." I found she had just calved—standing—and after the fœtal membranes came away, "she began to part with blood in jerts." A similar method of treatment was adopted as in the preceding case, and with a satisfactory result.

I have never seen a fatal termination in these cases, although the prostration has been very great—in some, almost to syncope. This good fortune may be due to a reduction of the fluid lowering the *vis-a-tergo*, and reducing the muscular contraction of the abdomen, so that the throes would be less frequent and not so effective in forcing out the blood. The ends of the vessels, too, would retract long before complete exhaustion.

It is quite possible—nay, probable—that untoward results may happen if in our anxiety we do not allow the animal that rest necessary after the excitation of parturition and the depletion following; we may have hectic with its attendant evils, and the poisoning of the system by the absorption of the morbid discharges, and the patient succumbs a martyr to excess of zeal.

Broken Knees.—It is seldom, unless an animal is more than usually valuable or the injury is severe, that our continued attention is called to these cases. In ordinary instances the owner or attendant has a bottle—in this district it is vulgarly termed "tinker," a pseudonym for tincture; unfortunately it is often so compounded as to be tenacious, and being applied too frequently without cleansing the wound, the dressing and discharges accumulate and form a huge scab, pus forming and spreading underneath to the extension of the area of the wound.

In simple broken knees—that is, where the joint is intact and the bones not injured—after removing the dirt by tepid water the air should be excluded by a double fold of lint dipped in water and *kept wet;* the lint dressing, especially if the wound is extensive, should be removed twice or thrice daily, and the temperature gradually reduced until quite cold. In hospital practice this cold water system has succeeded admirably, although in exceptional instances, where considerable growth was required, carbolic oil with the addition of Ol. tereb. was used. The factors necessary for an early growth with the least blemish are *perfect cleanliness, exclusion of air, at first frequent cold water dressings*, and *caustic to keep the growth level and the edges below the adjacent skin.*

Whilst speaking on this subject, I feel I must mention a recent occurrence in the police court in this city, as it concerns not only myself, but the honour of the profession.

The matter in question occurred with respect to a horse with a

broken knee; the wound was a severe one, being wide and deep, and the tissue was cut away; he was kept in the stable for three weeks, during which time granulations filled up the chasm, and cicatrization was taking place. Naturally there was no *new* growth of skin. At the end of that time, and in fact during the entire period, the horse was taken out and exercised, and he moved *perfectly sound*. Seeing that rapid movement made no alteration in the wound, that there was neither separation nor drag on it, that the horse was sound, and knowing him to be so "fresh" as to be almost unmanageable, I advised the owner to put on a knee-cap as a safeguard, and to work him. The attention of the cab inspector was attracted to him, I should say more from having on the knee-cap than from anything else, and he ordered him in. On my examination I found the wound was in the same condition as in the morning, and that he had suffered no injury from his work. The day but one after he was seen by the inspector for the R.S.P.C.A., doubtless taken by the former inspector to supplement his statement. The evidence tendered was that the horse was unfit for work, that the wound discharged "blood and matter," and that *the animal was lame*. I said that there was neither blood nor matter discharging from the wound, that the surface was moist, and that abrasion would make it bleed slightly is conceivable, but so far as their evidence went, they did not touch it, and there was no appearance of their having done so; as for the lameness, they had the horse turned round, and brought just out of the stable door, and he was neither walked nor trotted, and yet they said, without this test or any indications, that the wound opened and shut, which I distinctly denied. The case was dismissed.

It is not, however, in respect to the evidence *pro* or *con* in the case that I desire especial attention, but to a statement made by the Society's official. When asked in cross-examination by the solicitor if *he knew that a veterinary surgeon had ordered him to work*, he said, "*If a veterinary surgeon has done so, I should consider it my duty to summon him.*" Individually, I object to be terrorised like a school lad, and will gladly accept the gage that the worthy individual in bravado threw down.

We may talk about "social position," "professional status," and the like in a grandiloquent manner, but if we must accept the *ipse dixit* of such men, it is not only farewell to these, but to all sense of self-respect. I am not going to amuse your readers with accounts of their want of ordinary knowledge, but when they get into a box to air their abilities, they should at least know the meaning of "congeintal defect," or better than to make themselves foolish by the use of mispronounced and misunderstood technical terms. If these things are to be, we shall shortly go a degree further,

and on all such cases have to solicit the opinion of the inspectors (of course with fee), whether our patients are workable or not.

I wonder what would be said in a court to a man who is an expositor of humanity, and who half poisons a dog, pretending that he knows how to do it properly, and then, whilst he is rolling about, places a rope around his neck and strangles him: a double death, and revolting, except to the most hardened. The authenticity of this is undoubted. I have not moved in the matter, lest it might be said to be prejudice on my part; and further, I am neither spy nor jackal.

Wounds on the Coronet, whether small or extensive, often leave a blemish, a protuberance, that, even if the horse be sound, detracts greatly from his value, owing to its unsightliness; and this is irrespective of the *cause* of the wound, it is not material whether from tread, outside violence, or from Quittor; of course, the larger the wound the more extensive the blemish.

Years ago I had some trouble in restraining these wounds within decent limits, so far as new growth went. Astringents, caustics, and even the potential cautery were put in use, and in some they were necessary so often as to cause more than considerable pain, and, occasionally, even constitutional disturbance. I do not purpose to enter at length into the treatment of these wounds, except as to the fungus. It is generally found that the chasm is rapidly filled up with a spongy structure, the outer circumference more or loss hardened, softening towards the centre, which is perforated, the opening passing to the bottom of the wound. From the earliest stages in ordinary wounds, it is advisable, after the dressings, to put on a *tight, persistent compress*, removing it only for the purpose of cleansing and dressing, discretion being exercised. In Quittor, after sloughing out the interior of the cavity, and making it a simple wound, the same method should be followed.

I have found this system has saved the animal suffering, and myself a lot of trouble, and the cicatrix has been small and level, as opposed to the knotty prominences too often seen. Instead of retarding, it accelerates speedy recovery.

A FEW PRACTICAL NOTES ON ANTHRAX.

BY A. E. HOLLINGHAM, M.R.C.V.S., TUNBRIDGE WELLS.

I HAVE had the advantage lately of seeing a few cases of this disease; it is not a common one, and is often not recognised; but since it has been included in the Contagious Diseases (Animals) Act, it becomes imperative for every practitioner to acquaint

himself with its appearances, *post-mortem* and otherwise, in order that he may prove or disprove its existence. Of course science would say, why don't you look for the bacillus anthracis? but in ordinary practice how many men are expert enough with the microscope, or have sufficient time to spare for such investigations? Again, in practice opportunity is not generally present; we are taken into a locality, are shown certain animals, and are at liberty to make *post-mortem* examinations, but it must all be carried out expeditiously, and an opinion be forthcoming on the spot to the inspector under the Act (a policeman). Therefore in all these contagious diseases we ought to cultivate the art of quickly grouping such facts and symptoms as exist.

Referring to this particular outbreak, I may say that it was on Sunday, September 25th, when a farmer client of mine called here in rather a disturbed state of mind, to tell me that on the previous Wednesday he found a steer dead in a field where ten other steers and heifers were turned out in company with a mare and foal and a two-year-old colt. This steer was flayed and dressed by a butcher, and hung up to be boiled for pig-food. On the Friday morning the colt became ill, apparently with a sore throat; it was taken down to the farm buildings, and treated by mustard and hot water to the part, and soft food. During the day he was dull, and the owner began to be suspicious that it was not such a simple case as he first imagined, but at the same time he did not think it serious enough to call me in; later on in the evening the throat symptoms increased, but he described them as nothing particularly alarming. The colt was left for an hour at 8 p.m., and on going out again at 9 p.m. he was found dead. The following day the carcase was sent to the local knackers, whose farm and slaughter-house is in another county. On Sunday morning a fine Jersey cow in calf was seen at 10 a.m. to be a little dull, but she was chewing her cud; on visiting the field at 11 p.m. she was also found dead. This field was on the opposite side of the road to the field where the other animals had died, and the cow was by herself.

Such was the history given to me on the Sunday morning. This highly suspicious narrative determined me to begin the necessary investigations that afternoon, more especially as I knew there was a court of petty sessions held the following day, where, if my suspicions were correct, the case could be dealt with. I first visited the knackers' premises, and made an examination of such portions of the viscera of the colt as were available, and also a *post-mortem* examination of the cow. I found the larynx and trachea of the colt full of the remains of false membrane, and the lining membrane removed in patches, which

presented a purply black base such as might result from the application of a hot iron; the tissues surrounding the larynx were much infiltrated and thickened by a bloody gelatinous exudation, the other parts of the carcase were in a condition not favourable for investigation. The cow, however, remained, and from my *post-mortem* notes I find that the most striking appearances were found in relation with the connective tissue; wherever it existed in any quantity it was enlarged and infiltrated with blood and gelatinous material; the tissues around the larynx presented much the same appearance as those of the colt, but the lining membrane of both the larynx and trachea was intact. The liver was slightly enlarged and friable, and covered with petechial spots varying in size from a No. 6 shot to a horse bean. The spleen was about double the usual size, and showed on the surface one patch of spots, and was full of very dark fluid blood; the kidneys also showed spots on their capsules; the pericardium showed a few petechiæ on its surface; the external surface of the heart showed three or four large patches; the endocardium of both ventricles were covered in the same manner, more apparent in the right than the left. Such, in a few words, were the *post-mortem* appearances which came under my notice. It was too late to visit the farm that night, but on the following day I spent a considerable time in trying to elucidate the cause of this outbreak.

The two fields where the disease appeared were situated on high ground, a road running between them, and no other cattle in the vicinity; the feed was grass and hay, and the water supply derived from a pond in one corner of the field containing the steers and mare and foal, and it is to this pond-water I ascribe the infection. In the first place, from diligent inquiry I found that five years previously several head of stock died in this field very quickly one after the other, and now and again since one has died at odd times. In the spring of this year several ewes and lambs were put to pasture in it, and seven or eight were lost in two or three days; they were then removed, and, generally speaking, I found from old people in the neighbourhood that this particular ground had a bad name for stock-feeding purposes (I may say my client had not long had possession). Again, the cow which died in the other field was supplied from the same pond; also this pond was what we term mudded the latter part of this summer, and the mud thrown in a heap on the grass, and for some weeks the supply of water which is derived from surface drainage was very scanty, thus producing a state of affairs which, coupled with the prevailing hot weather, was very favourable to germ growth.

Of course my first care, after forming an opinion, was to have

the remaining animals removed into an adjoining meadow, and their drinking water supplied from another source, in addition to which I directed in the first place that a cathartic should be administered, to be followed by ʒj doses of acid. carb. night and morning. There have been no fresh cases, and one heifer and the mare which at the time of my visit showed suspicious symptoms, have recovered. In connection with this outbreak, I may say that three or four cats have died after eating the raw flesh of the steer, and a dog which partook of some showed bad throat symptoms, was unable to bark, and generally very ill; the owner, having very little hope for it, gave as an experiment half doses of the acid. carb., sent for the stock, and, strange to relate, recovery took place. This is remarkable when we consider the intense toxic action which carbolic acid generally exerts on the dog.

REMITTENT ANTHRAX.

BY R. W. BURKE, M.R.C.V.S., ARMY VETERINARY DEPARTMENT, LAHORE.

(*Continued from page* 350).

It will be seen that the Anthrax microbe, in the course of its evolution, passes through different forms; the spore form—that of longer or shorter rods, chains, etc.—is, in fact, polymorphous. At first it might have been supposed that the shorter rods were accidentally present in the tissues examined, but rabbits inoculated with blood containing these rods show both shorter and longer rods, as well as chains, in the same patient, and which moreover stain alike. There cannot be any doubt, therefore, but that the shorter rods seen by Toussaint and myself are the rods of Anthrax, which not only produce virulent Anthrax on inoculation of healthy animals, and stain readily in the same colouring fluids as the longer rods and chains do, but, as I have found, *produce the longer rods and chains on transference to the system of another animal—e.g., rabbits.* It is evident, therefore, that the morphology of the Anthrax microbe is not sufficient to determine the species.

Altogether, there is a pretty general agreement regarding the contagious (this does not necessarily mean contagion through simple contact of animals) nature of the disease, that it is caused by some specific agent, although that agent was not yet demonstrated, in the case of the present outbreak, previous to my arrival. Every one is agreed also as to a living organism being the cause of so specific a form of fever; and because weakly animals succumb first, and stronger ones recover, we do not conclude that this is simply a disease of starvation or squalor in grasscutters' ponies, or even—in the case of pulmonary complications so frequently pre-

sent in this disease—due to exposure. In Paris, cold has been lately applied to dogs in iced chambers, the hair being shaved off on one side till they were collapsed almost, and yet in *no single* case did disease of the lungs ensue. It is probable that neither exposure, nor poor feeding, nor filthy surroundings, are more than the aiding causes of a serious outbreak of this disease, and it is an already proved fact that the *Bacillus Anthracis* in the air, water, or food is the *fons et origo mali.* With regard to the pathological condition of many of our so called "new diseases," we are still in the dark, though it is probable they are of the same nature as many old, and sometimes familiar, diseases, and differ only in minor physical characteristics of intensity, mode of appearance, and other features.

A symptom to which special attention should be directed is motor disturbances. The motor affection was shown by the frequent paraplegia, twitchings and spasms of the muscles, and affected the muscles of the hind legs in particular, producing Stringhalt, unsteady gait, etc. Symptoms allied to the above are not uncommonly noted in many outbreaks of Anthrax among horses in Australia (See VETERINARY JOURNAL, September, 1878, p. 211.) These symptoms point to capillary plugging, and effusion on, and affection of, the circumvascular connective tissues of the motor apparatus of, the brain and the spinal cord as their essential pathology. There can be no doubt about these changes being due to the multiplication of the *Bacilli Anthracis* in the capillary blood vessels and their escape outside the vessel walls. This explanation appears all the more feasible when we consider the rate of multiplication peculiar to the Anthrax microbe. These cases of partial paraplegia, without paralysis, form at the same time the transition to the "masked" state of complete loss of power behind, noted in many former outbreaks of Anthrax in the horse. The belief that all the motor loss is due to the plugging of the capillaries is not difficult to explain; the *Bacilli Anthracis* increase with marvellous rapidity outside the vessel walls, as in chicken-broth and other cultivation media. The rapidity with which animals lose flesh in these cases is also characteristic of Anthrax. In this disease, where a metamorphosis of the whole of the body has begun, the cells are no longer capable of performing their function; and so we find that the animal wastes away, even when he consumes a fairly large quantity of grass, and is on extra ration during the time of his illness.

Regarding the course of the disease: A very important research, bearing on the conditions of infection of specific diseases, has been recently made in England. In this research it has been pointed out that the initial dose of virus is of great importance, and in

several instances exercises a marked influence *on the course and virulence of the disease.* Various laws have now been made out—for example, the pathogenic dose of a virus varies inversely with the predisposition of the animals to the disease in question; in animals not very susceptible to a disease, the severity of the affection varies directly within certain limits with the amount of the virus introduced, etc. It is found that in some cases a small dose of a virus produces only a local effect, while a larger dose kills the animal, and the small dose often protects the animal from the fatal effect of a subsequent large dose. Although it is as yet impossible to measure predisposition, and thus to decide the dose for any animal, still the knowledge of the relation between these two factors is of great importance in throwing light on the manner of spread in many outbreaks; while the fact that a considerable quantity of the virus is in many cases necessary for the production of a disease explains many anomalies, and affords indications for preventive measures.

We have a better reason than has existed before for believing that the subject of equine fevers promises soon to assume something like definite proportions, corresponding in some degree with the fevers seen in man. The careful studies which have been made of late years concerning the fevers peculiar to the lower animals have supplied the groundwork for the rational treatment of certain hitherto ill-understood cases. Only recently Mr. J. H. Steel, A.V.D., has drawn attention to Relapsing Fever in equines, and Dr. J. Bland Sutton, of London, has taken up the study of Typhoid Fever in animals—each of whose labours promise good harvest of results in the not distant future. No other subject is so replete with interest as that of fevers seen in the lower animals, and although the subject has been somehat shrouded in mystery in the past, we now have at least the prospect of improvement. The facts and conclusions under any circumstances take some time to collect, but when a general system of inquiry has been encouraged, important solutions will be forthcoming, proving many of our former ideas about disease to be both obsolete and useless. This has been very much the history of all the specific diseases; our notions with regard to the causes of these having been completely revolutionised within the last few years only.

We are of opinion that a careful study of the disease called Influenza in the horse would lead to its being divided into three or more distinct affections. Further, we think that the distinctive characters of different forms of fever in the horse are such as in practice could not allow them to be confounded any longer—an opinion which all subsequent observation must tend to confirm. We may have Remittent Fever and remittent type of Anthrax in

the horse, and although the two fevers are essentially distinct, the one might supervene on the other.

Treatment.—The three essential points in the treatment of this disease are, it is obvious, change of air, change of water, and change of locality on the first appearance of suspicious cases. Such indications are not fulfilled by the ordinary plan in vogue of drugging animals. It was change of locality which practically checked the disease in the last outbreak among the horses of the 19th Bengal Lancers Regiment, as previous to it no plan of treatment or prevention had the slightest influence for good. When a few cases of this disease occur in any regiment, the risks of an enzootic attack are considerably increased by keeping animals in an Anthrax-contaminated locality week after week. Simple segregation of affected animals does not suffice to keep the disease in abeyance. The animals must quit with the least possible delay, in order to avoid infection from the tainted ground. Extension of the disease is kept up for months by persistent occupation of tainted lines, until considerable loss has been experienced. In order to obtain a favourable result from our endeavours at prevention, it is necessary to sacrifice the cost of a new flooring, and have recourse to prompt and effectual removal of tainted earth. We must acknowledge that, whilst firmly convinced that dozens of animals may be easily saved by timely adoption of the above-mentioned precautions, there are great difficulties and disappointments inseparable from the carrying out of proper segregation, which I believe to be the chief causes of these failures. One great cause of failure, I believe, is inequality of the measures adopted in different outbreaks, when the proper time for prevention had been allowed to pass by. The probability of an extension of this disease depends less on the special nature of preventive treatment recommended than on inefficiency of such measures as are often employed. The running at large of grasscutters' ponies during an outbreak of this disease is a frequent cause of diminished usefulness of preventive measures which are adopted. Veterinary Surgeon (1st Class) Clayton has forcibly brought this to notice in the case of the disease seen in the 8th Hussars; since his report was made, no fresh cases have appeared among the horses up to date. It is often forgotten that the most critical time for securing the movement of suspected animals is when the disease is absent in others. It is necessarily of greater importance to avoid contracting disease, than merely to attempt to suppress it among an already infected lot of animals. The extreme importance of preventing at every point the chances of entrance of the contagion into untainted lines cannot very well be exaggerated. *A knowledge regarding the period of convalescence*

is of importance in preventing risk of infection by exposure of healthy animals to one which may have just recovered from an attack and be still convalescent. Anthrax may be communicated by the sick animal when the severity of the illness is past, and while recovery is being perfected, since every secretion and excretion of the body in this disease is a carrier of infection. Too great care cannot, therefore, be taken, so long as cases of this disease appear, in preventing a return of apparently recovered animals, which are at the time even more dangerous than when suffering from an acute attack and unable to move about. Undue alarm should be avoided, but we must insist on the importance of fresh air, fresh water, and change of locality, above all, in the treatment of suspected animals. Recent observation shows that a certain local and seasonable condition is essential to the spread of Anthrax, these two factors being found in a porous material, the soil, penetrable by air and water, and soaked with organic substances (local predisposition) and in variations in the moisture and temperature (seasonable predisposition). The first essential condition of Prophylaxis is immediate evacuation of the tainted ground, and checking contagion by early isolation of the sick, and by observing the necessary precautions which stave off an attack among the healthy animals. Immunity is also obtained by guarding against exposure, want, and debility in the case of grasscutters' ponies, this precaution being found necessary, since transmission of the disease, in these, is often dependent upon constitutional weakness, or upon degrees of predisposition and susceptibility. Acting upon our experience of former outbreaks of Anthrax, we may formulate the following rules of prevention, namely—

(*a*) Not to return any animals as "fever free" without having first ascertained, either by the use of the thermometer or other means, that such is the case.

(*b*) To remove the conditions of soil favourable to the growth of the microbe, the infected standings must be renewed. The prophylactic treatment of tainted localities by enforcing rules of sanitation, and by avoiding the pollution or infection of the earth with Anthrax material—cadavers, the manure or offal of diseased animals, will always be the chief means of preventing an outbreak of the disease.

Protective Inoculation.—It is a great satisfaction to learn that the Government of India have under consideration the question of bacterioscopic laboratories being opened in many central stations in India; because there can be no question that such laboratories are necessary, where Anthrax-"Vaccine" can be prepared for distribution to the different mounted branches of the service, as well as in the agricultural districts throughout the country. Looking not only to the interests of the army, but to the neces-

sities of British India, the death-rate from Anthrax in all classes of animals is a terrible calamity, and every Government should do its utmost to avert it. The entire tendency of modern inquiry is in favour of protective inoculation; enormous saving to the country may be effected by organising central laboratories in India for the purpose of sending "vaccine" fluid into the agricultural districts; and it is difficult to see how postponement of such an evident means of saving to the country is possible. In some parts of Russia, where Anthrax is very frequent, carrying off some thousands of animals of that country annually, preventive "vaccination" has reduced the mortality from this disease to two per cent., as in every other country in Europe. It may therefore be considered as the most urgent necessity which the Government of India have now under consideration.

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PROTECTIVE INOCULATION FOR CONTAGIOUS PLEURO-PNEUMONIA.

BY J. A. NUNN, F.R.C.V.S., F.R.G.S., ARMY VETERINARY DEPARTMENT, SOUTH AFRICA.

As of late the question of protective inoculation against bovine contagious Pleuro-pneumonia has been prominently before the profession, perhaps the following instance of the value of it may be of interest to your readers. A gentleman, resident near Pietermaritzburg, had occasion to go on business to the gold fields at Barburton in November, 1886, taking with him three Cape waggons, drawn by oxen, of which altogether he had fifty. He returned about January 1st, 1887, to Natal, leaving the oxen at Ladysmith, the terminus of the Natal Railway. Round Ladysmith Pleuro-pneumonia was rife, and very shortly he received news that one of his oxen was attacked by the disease. The

animal was slaughtered, and, as no further cases appeared, the rest were brought down to his farm, but had not been there many days when three more were attacked. These I saw, and had an opportunity of making a *post-mortem* examination, and the disease was most undoubtedly contagious Pleuro-pneumonia. Fourteen of the cattle had been inoculated two years previously, and with the exception of working in one particular waggon, were treated exactly the same as the rest. The remaining thirty-four were inoculated from one of the three bullocks I saw in the end of January, and of these seven died, making a total of eleven deaths amongst the thirty-six unprotected; but not a single one amongst the fourteen that had been inoculated two years before, and had been exposed to exactly the same influences. Inoculation, as a preventive against Pleuro-pneumonia, is very largely practised in South Africa, both by Europeans and natives, and the inference I have been able to draw from the observations I have made in Natal is that, if the animal is in the incubative stage of the disease and is inoculated, that he succumbs rapidly; but, if not, that protection is given for, at all events, two years, if not, as I have every reason to believe, longer. The inoculating virus is obtained from an animal that the disease has manifested itself in for about seven days, and which is killed, this being a point on which the Natal farmers lay particular stress. A portion of the lung is then placed in a clean vessel, such as a bowl or deep dish, to allow the serum and fluids to escape. A piece of lamp-cotton is put into it to act as a syphon, the fluid being collected in a second vessel at a lower level. As it drops over from the syphon, small pieces of cotton or tape are placed in it, and these are inserted into the under part of the tail as setons, and the animal let go. Great attention is paid to using the virus as fresh as possible, to the fact of the disease being as near the seventh day as possible, and the animal from which it is obtained being destroyed, not allowed to die.

NOTES ON PURPURA HÆMORRHAGICA IN THE HORSE, WITH A FEW REMARKS ON THE MICRO-ORGANIC FORMS MET WITH IN THE SAME.

BY F. C. MAHON, M.R.C.V.S., SOUTHSEA.

THE opening of a Laboratory specially dedicated to the pursuit of bacteriological studies and researches into the life of micro-organisms, is an epoch in the history of the "Germ Theory," which at the present moment occupies so important a position in the scientific world, and especially to those of both medical and veterinary professions, between whom much exists, or should, in

common, especially relative to those intercommunicable diseases of man and the domesticated animals. Not a few of these could be prevented if the relation of animals to man were well understood, both as regards the consumption of flesh and the milk supply, and also intercommunicable diseases by inoculation from them, chief of which may be mentioned Glanders and Anthrax. The controversies respecting hæmal diseases divide themselves into two classes, especially so in the case of the disease now under notice, viz., Purpura Hæmorrhagica. Briefly, a divergence of opinion has long existed as to the chemical, chemico-physiological, and micro-organic theories of this affection, and though an important disease in the *rôle* of hæmatinic complaints, has never been satisfactorily placed in the true sense of classification.

The views of such able contemporaries as Prof. Limont, Glasgow, and Mr. F. Smith, A.V.D., on the organisms met with, and the chemical analysis of the blood respectively, have of late occupied the pages of the VETERINARY JOURNAL. The vexed question, however, will remain still, until, like other Hæmata, it is thoroughly investigated, both chemically, histologically, and pathologically. Like diseases of a hæmal nature, and approaching in many of its clinical features to Anthrax, and especially where the swellings, peculiar very often to the head, neck, and throat, are most prominent—to Gloss-Anthrax, likewise also Pyæmia and Septicæmia, where oftentimes it has some little connection, these being proved to be of a micro-organic nature—Purpura is an affection where a field of inquiry stands but little trodden, and we are at a loss yet to supply any good grounds for satisfactory data of origin and classification. It is with diffidence I beg to support the statements of Prof. Limont, relative to the micro-organic forms met with in seven patients who had succumbed to this disease—that is, the three distinct and fertile organisms met with, beside auxiliaries which, in such diseases as Influenza, Pyæmia, Septicæmia, and even in the blood of healthy animals, we find not only in the blood, but tissues. By many, chemical affinities play the chief *rôle* in the pathology of Purpura, an altered blood system, and contained blood elements, with putrefactive and fermentative changes now and then resulting. By others, and a larger school of scientists, it has yet to share many diseases, which of late years have figured prominently in our country, viz., Glanders, Foot-and-mouth Disease, Anthrax, Swine Plague, etc., etc., such being due to the invasion of micrococci, bacilli, and bacterial forms of various divisions of the vegetable world. To supplement Prof. Limont's views is to share with him a knowledge of the three distinct forms enumerated in the August number of the VETERINARY JOURNAL, and which, I trust, will but be a prelude to a rigid exposure of the

disease, by those who are placed mostly in contact with the affection, and whose hands are at liberty to devote to a study microscopically of its blood and exudative fluids. As yet, we cannot but add that the organisms play a secondary part in its causation, as no experiment with the chief rod-shaped bacilli met with has yet been made, and as the exudate from the bacterial forms of disease, or an altered pabulum by their invasion in the blood stream and animal tissues, is believed by many to be the chief agent in disease production, this will doubtless have to be considered duly. In all of the seven patients who succumbed, bacteria, chiefly the rod-shaped bacilli, occupied a prominent position, being found not only in the spleen and splenic vessels, but likewise in the posterior aorta, heart, abdominal vessels, and jugular, together with that of the phlectynæ in the thoracic and abdominal organs, and contained exuded fluids, exudation from the blood conduits being a well-marked occurrence in Purpura. The rod-shaped bacilli are in length midway between B. Anthracis and B. Tuberculosi, showing no signs of spore formation, as in Anthrax.

In the jugular and posterior aorta, micrococci—both coccal and diplococcal forms—abounded, also in the exudations into the connective tissues, abdominal cavity, and in the serosity of swellings of head and throat. "Streptococcus Pyogenes" I found in the blood of a patient who lingered for thirteen days, and where grave structural pathological changes had ensued—aged cart-horse. Hygienic arrangements being below par, the animal over-worked also, and surroundings of a moist, damp character.

The organic forms found in the blood in Purpura Hæmorrhagica, and in the exudate thereof, are not distinct from the organisms met with in Pyæmia and Septicæmia, except the well seen and numerous variety of the rod-shaped bacilli, approaching the red corpuscles, touching them occasionally, chiefly segregated, occasionally found in twos and threes, at right angles, not found however in close proximity to the white. Just as an animal is predisposed by debilitating influences—climatic and dietetic, and subservient to the wants very often irregular of man, by agents chemical, that is fluid or solid particles of protoplasmic nature, entering the system by air, food, or water, producing death, by destruction of blood elements, loss of oxygenating power, anæmia, and death, with changes resulting in softening, destruction, or proliferation of cell elements, the endothelial lining of the blood-vessels, so we give these changes well marked here.

The causes enumerated by many of Purpura lie chiefly in hæmal poisons, defective hygiene, improper drainage of habi-

tations, housing, food, and work, with water supply, often contaminated by sewage, or by plants and substances undergoing chemical and other disintegration, noxious effluvia permeating the air respired, rendering them impure and so noxious and destructive to animal vitality. Such in over-crowded stables of bygone days, faulty in many particulars, still pertaining even to many modern; and it is here that hæmal diseases occupy not only prominent positions, but are less amenable to treatment, are prolonged in their stay, leave sequelæ of a character, lowered vitality, and defects of locomotory organs, but, chief of all, structural changes in the organs of organic life. Purpura I have met with following not long after an attack of Strangles, and Richard W. Burke, A.V.D., recently records a case following upon an attack of Rheumatism. The cachexia established by the above agents leaves a lesson which is within the reach of prevention, and doubtless will, when the disease is thoroughly known, lessen its frequency and effects. Taking a percentage of horses met with in town and country practices, where any large number of horses are at any time collected together, subjected to the above-mentioned influences, do we not find Purpura here present, in its most severe and fatal nature?

"Diabetes insipidus" is occasionally a precursor of Purpura, and it follows also a disease, which of all diseases, with perhaps the refined divisions of Continental writers, as an exception, viz., Anthrax. Considered from a natural history point of view, are the micro-organisms met with in this complaint capable, by chemical agents, of being transformed at certain periods of tissue changes? and when controlled, by external media, of being transformed by such, from non-pathogenic properties to pathogenic, for in such chemico-physiological and auxiliary changes due to the bacterial concomitants finding now a fertile soil, and allowing of morbific changes? F. Smith, A.V.D., in the August number of the VETERINARY JOURNAL, has furnished a long-wanted chemical analysis of the blood, with comparative changes of excess or diminished chemical changes in purpuric as compared with normal blood. And from this is gathered the excess of those materials in which micro-organisms find a suitable pabulum for growth, increase, and play, viz., a deficiency of fibrine, iron constituents lessened, watery elements likewise, and, with such alterations in the contained fluid, structural alterations following.

Induced last year to pay some little attention to many of the phases of Purpura, and examining casually some specimens of tissues and blood of patients, and suspecting bacterial causes, I met with the organisms hitherto referred to, and the well-marked bacilli, by Cohn's method of staining. In the sperm of a rabbit

inoculated with purpuric blood, also in ecchymosed patches on the left side of the heart (endocardium), these bacilli were discovered. Further, that the *bacilli* found in the blood, and exudate from the circulatory system, is distinct, insomuch as they do not correspond in many details with any other recognised bacilli of such diseases as Pyæmia, Anthrax, Glanders, etc.; that they approach closely in position—that is, direction—to the "bacilli septica" of Billroth. Experimentation may prove non-spore formation; may be an organism exists distinct even from the three forms alluded to, and if it is possible for a non-pathogenic organism to be, altered fluids become pathogenic, it is not beyond reason to suppose a like change here. As an animal system, rendered by causes enumerated hitherto, so well known to all, predisposed to harbour organic forms, should alone of many hæmal affections, prove an exception, cannot long remain, and that the pathogenic organism, for undoubtedly it will share the fate of many allied affections. The well-deserved tribute of praise to the discoverers of the organism of the terrible malady known as Glanders, by the old school of practitioners, and even in this our own day, held by many who are bigoted in their opinions, and hold opinions very often foreign to reason, should be paid, as doubtless it will, to the discoverer of the pathogenic organism of Purpura, or if it can be proved to be allied to many or one affection, its nature chemical, or chemico-physiological, with germ auxiliary production assisting its *ætiology*. If also a particulate substance in the future be found existing in animals, the subjects of this disease—a substance which can be measured and secured by the scientific instruments of the present day—this, with the ultra theory, sustained by precedence, by knowledge of everyday contact with diseases of a hæmal character, the organic theory will be such, when the organism or organisms met with be each, or all, proved to be cause, not effect.

Germs enter the animal system in many ways: by (1) Mucous membranes, especially where abrasion, or denudation of epithelium be present, or loss of vitality by agents chemical, or otherwise, *via* air-passages. (2) Alimentary canal, by water, food partaken of accidentally, or by natural means. (3) By wounds, or abrasions on the skin, and many others of a minor character and intensity, relative to the three distinct and great divisions above named.

In alluding again to the natural history point of view, as to whether bacilli of harmful properties are rendered so, that is, pathogenic, by chemico-physiological changes in the blood, tissues, and exudate, in which the organisms move and have their being, at least for a variable period during their life-history; and have we here a bacillus, which, finding an altered medium, a suitable soil, is convertible by the same means as *Bacillus subtilis* into the patho-

genic B. Anthracis, or *vice-versa?* There is only one test remaining for such, *viz.*, prolonged and protracted experimentations in culture mediums with inoculatory experiments with such animals as form suitable media for such purposes, as in diseases classed as the contagia, so familiar to all.

To esteem disease germs as occurring in the body without previous infection, and as a result of morbid processes are maintained; some maintaining they may exist in all living and healthy animals, and are not the inducing factors of disease production, only proving so, when in increased numbers, and under the circumstances favourable, of a physiological or chemical nature.

Cases have been cited where after the use of the actual cautery in horses for Spavin, or bony exostosis of the limb, Curb also, another pathological change—Purpura hæmorrhagica—has resulted. Was the cause here hidden, or in abeyance, until the nervous changes, or hæmal, brought about by the shock on the system, revealed and provoked the elements of Purpura into disease play? Could this truly be Purpura, or was death purely Pyæmic, or Septicæmic? Professor Limont cites:—

1. Cocci, minute.
2. Large cocci (Streptococcus Pyogenes).
3. Rods—the latter in all cases seen by me, where the spleen was markedly involved.

Bad sanitary arrangements are thought first to occasion a contagious disease, but such statements are fraught with absurdity; they act only as a predisposing cause in two ways. (1) Directly, by inviting germs. (2) Indirectly by deteriorating the animal system, weakening its functions, and rendering it directly susceptible to bacterial onslaught.

Whether Purpura will be added to the list of a large group of diseases producing results, as having their origin in animals, and acting upon man, being those which operate through the ingestion of animal tissues as food; whether, also, parasitic existences, or specific diseased conditions are adduced, which exert their power of disease induction, by direct implantation from without of germs inimical to healthy vitality and longevity of animal life, and are there organic entities, or minute particles of specially formed protoplasmic matter, capable of changes. In altered suitable media, bacteria cannot exist where gases are given off, according to many eminent authorities; the organic forms existent in Purpura would therefore not gain exit from bad drainage, noxious gases, etc., or in very limited number, and so be productive of but little harm. The quivering motion which is also seen or exhibited by lifeless and inorganic matter (Brownian movement), is not seen in the inorganic matter pertaining to purpuric blood.

By transudation, *i.e.*, motion from one place to another, we prove the difference between bacterial organic life and inorganic germs usually present in water, as Dr. Burdon Sanderson has demonstrated, and Professor Tyndali has obtained germs from the centre of a block of ice. Bacteria are not only associated with fermentative changes in fluids, but also stand in a casual connection with various diseases. This they do in two ways, either by producing changes in the fluids leading to the formation of poisonous products, or by growing in the blood and tissues of animals, thereby leading to disease and death.

That the products of the growth of bacteria in albuminous fluids are of themselves poisonous, was long ago made out by Panum, who found that putrid fluids, boiled and filtered, so as to get rid of all bacteria, still caused Fever, by injection in large quantities, also the death of the animal.

Malignant œdema is a disease in which bacilli grow in the connective tissues, not in the blood-vessels, and cause inflammation and rapid death of the animal. They are shorter than the *Bacillus Anthracis*, and cannot grow in the presence of oxygen. They also produce spores.

Whether here we have a soil, by chemico-physiological changes rendered a suitable soil for bacterial invasion, is still an open question, and if, as above seen, bacteria can grow in an albuminous medium, they of themselves primarily of a non-pathogenic nature, but altered here, or altering, through changes in the blood of an albuminous character, but we have reasonable grounds for deductions and argument. The *post-mortem* appearances of Purpura closely simulate Anthrax, and it may yet prove an allied affection, though in no case have the bacilli of Anthrax, the cause, *par excellence*, of the latter affection, been seen. Unlike Anthrax, however, it does not appear as Anthrax in its varied forms, as capable of propagation by infection or inoculation, nor has there yet been demonstrated to exist in the blood of animals suffering from this disease the specific organisms of pure Anthrax. The local swellings, too, both as to character, mode of development, etc., and relation to the termination of the disease, are totally different in Purpura from those of Anthrax. It is probably a neurosis which, inducing changes in the circulatory system, favours the habitat of micro-organic forms, which probably play a part in fermentative and putrefactive changes. Following Influenza, Strangles, or even common Catarrh, diseases in which the nervous system suffers primarily and markedly, it seems worthy of some consideration of this view of its nature.

The experiments carried out by myself on a few animals may not be acceptable, for we require animals of the same nature to prove many of the properties of those agents which produce

Purpura ; they are here enumerated briefly. They were confined to dogs, guinea-pigs, and rabbits :—

1. Concerning the dogs, two in number. Inoculation—intravenous (jugular) produced *nihil*; food, *i.e.*, uncooked meat, taken from the face of a patient who succumbed, produced no visible symptoms, nor was any change evinced by them after partaking of the blood of the same.

2. On the rabbits (inoculation, intravenous, per jugular). Blood-poisoning (septicæmic) resulted on the sixth day ; 50 minims of blood taken from the jugular, and 20 m. from the exudation in the swellings of the head and lips being intermingled.

(*b*) No. 2. On this rabbit no effect when inoculated with materials from the spleen into back of ear.

3. With the guinea-pigs, however, I had different results. The rod-shaped bacilli were discovered, though in limited numbers, here in the heart and spleen, death resulting on the eighth day after inoculation.

But until further, more extensive, and finished experiments are conducted with blood and exudations, and inoculatory experiments be adduced, and cultured mediums used as the chief fluid, it must still remain an ill-understood or satisfactorily understood affection.

It is rare for mares or stallions to suffer from the affection ; perhaps there are some who can adduce cases, however, where exception could be taken.

In concluding my observations relative to *Purpura hæmorrhagica* in the horse, perhaps it will be in the power of older men, more experienced than myself, to add to our knowledge of the affection, and prove or disprove much that is here brought forward, more as a corroboration and argumentative basis, than from any desire to infringe on the tried knowledge and experience of abler veterinarians. Whether now Purpura will share with Anthrax, Glanders, Tuberculosis, Swine Plague, etc., the fate of being due to bacterial invasion, or whether, with chemical, chemico-physiological changes, as auxiliaries in production, remains still in abeyance.

Editorial.

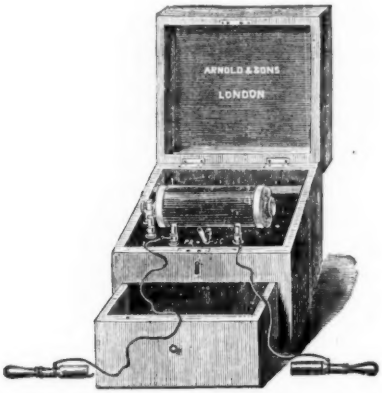
ELECTRICITY AS A THERAPEUTIC AGENT.

It is somewhat remarkable that electricity as a therapeutic agent in veterinary medicine has been nearly altogether overlooked in this country. In our text-books—and they are now somewhat numerous—little or no mention is made of it, and the notices of its employment in the treatment of the diseases or defects of animals which have appeared in our journals, are extremely few and meagre. On the Continent it has certainly received more attention, and has been studied and applied as a remedial measure by such veterinary notabilities as Hering, Lafosse, Bourrel, Mairemangin, Legier, Rodet, Brogniez, and Tripier. Needless to remark that in the medicine of mankind it is extensively employed for various purposes, and in nearly every hospital there is an electrician whose business it is to apply it in those cases for which it is deemed most appropriate. Its value as a stimulant to excite muscular and nerve tissues which are the seat of paralysis, is universally recognised; while its effects as a stimulant to nutrition generally are undoubted. Its chemical action has even been successfully employed in dissolving tissues and coagulating blood within aneurismal sacs, and its thermal effects are often resorted to in surgery for heating cauteries.

If electricity is found to be so advantageous in human medicine and surgery, surely its aid might be invoked by veterinary surgeons in those instances in which its employment is indicated. It has been tried, and with satisfactory results, in cases of special fevers in the horse; in Chorea in the dog, and in paralysis due to muscular atony or defective nerve conductibility it has been employed with benefit; also in Colic due to diminished peristaltic action of the bowels, tardy contraction of the uterus in parturition, in synovial distention of joints and bursæ, in herniæ, and for the relief of pain. Quite recently it has been most encouragingly experimented with in "roaring" in horses, and there is every reason to believe that, but for its employment, one of the most famous racehorses this country has ever produced—the Duke of Westminster's Ormonde—would not have achieved his late victories at Ascot—victories which crown a career on the turf unmarred by a single defeat. In such cases, the electricity applied systematically and skilfully, preserves muscular tissue in health until the brain or nerve which excites it regains its function.

The scope for the employment of electricity in veterinary practice should be somewhat wide and varied, and we may indulge in the hope that electro-therapeutics shall receive some attention from those among us who are desirous of enlarging our curative resources. What has militated somewhat against our more frequently seeking its services has been the want of a battery specially adapted for veterinary use, but we

fancy this deficiency has now been made good by the instrument manufactured at our request by Messrs. Arnold, of West Smithfield. This battery consists of four patent Leclanché cells, to which is attached a Faradiac coil. The strength of the current is easily regulated by means of a graduated rod, which denotes its intensity, while the battery is arranged with primary and secondary currents, with commutator. The construction of the instrument is such that it is impossible to close it without interrupting the current—a great advantage in veterinary practice, and on opening the lid the action is at once resumed.



In addition, the conductors are made of unusual length, so that the battery may stand on a chair or even on the floor, while the Faradisation is practised upon the animal patient.

These improvements will simplify and facilitate the application of electricity in veterinary practice, and render resort to it less repugnant.

STUDY OF A BACILLUS CAUSING NEPHRITIS IN THE OX.

BY PROFESSOR S. RIVOLTA.

THIS disease has been observed as an enzootic in the Roman Campagna during the summer, particularly in pure bred Swiss and Dutch cows that have been recently imported.

Professor Vogliata recognised the disease as what has been described by Metaxa as "Ataxo Dynamic Nervous Fever," by others as "Pernicious Fever" and "Hematuria," with the following symptoms:—At the first onset elevation of temperature to 39° or 40° Centigrade, the urine turning a dark red colour with a greenish tinge through it. The animal becomes dull, the coat stands up on end, the eyes sunken, the mucous membranes tinged with yellow, and the fæces hard. Motion is difficult, the hind limbs being moved with difficulty. A little later rumination ceases, the temperature rising to 41° Centigrade. The urine becomes coffee coloured, muscular spavins set in, and

the pulse is very quick. The temperature then rises to 41° 5 Cent. to 42° Cent., descending rapidly to 39° Cent. or 38° Cent., the animal dying without being convulsed. Abortion is a frequent complication.

After death the blood is found black and fluid as in Charbon, the intestines congested, the liver yellow and engorged with blood, the spleen tumefied and nodulated on its surface, the bladder distended with bloody urine. The lungs show sub-pleural hemorrhagic patches, and the endocardium petechiæ. Professor Rivolta has discovered a short fine bacillus in the blood differing from that of Charbon under the microscope, but not in preparations made with the pulp of the spleen or the liver. Sections of kidney showed sub-acute interstitial Nephritis, as well as the bacillus found in the blood, which was demonstrated by Gram's method. They were present isolated, and united in twos and threes, straight, curved, and bent at an angle, with an imperfect segmentation. Their length varied from $\frac{2}{1000}$ to $\frac{8}{100}$ and their breadth $\frac{1}{1000}$ of a millimetre. These bacilli were never found in the spleen or other parenchymatus glands, although their presence in the blood would indicate their presence.

Inoculations on the rabbit and pig had no results, neither had they in those that were made on cattle; and the author arrives at the conclusion that results are only obtained in animals previously predisposed. The conclusions he came to from his experiments are:—

1. That a sub-acute interstitial nephritis exists in cattle, due to a specific bacillus.
2. That this disease, with its accompanying complication of Hematuria and Hemaglobinuria, causes obstruction of the omasum.
3. Many bacilli coloured with gentian violet show their protoplasm in the form of a small round mass.
4. In the kidneys they multiply by division, and are transported by means of the lymphatics and blood vessels.
5. The majority of the short bacilli appear to have their habitat in the lymphatics.
6. The bacillus, from its irritant action on the kidney, Rivolta has named the "Bacillus nephritis bovis."

THE MICRO-ORGANISM OF TETANUS.

BY DAVIDE GIORDANO.

SOME experiments performed in the laboratory of Professor Perroncito, were made on animals inoculated with various pathological products, obtained from a man who died of Tetanus after an accident in a hay loft, which caused severe contusions, accompanied with wounds.

The necrosed tissues from the wounds beaten up in a mortar with sterilized broth, were inoculated into the conjunctiva of three guinea-pigs without any result. The microscopic examination of this necrosed tissue showed numerous micro-organisms, but not the bacillus described by Nicolaier and Rosenbach.

Inoculation made with a culture from this solution, from blood from the wound, the neighbouring nerves, the spinal cord, and the splenic pulp, gave no results. A drop of a cultivation made from a drop of pus obtained from the sheath of one of the vessels of the arm of the patient was inoculated into the cellular tissue of a guinea-pig. Rigidity of the members appeared the third day, which became general the day afterwards. A purulo-sanguinous discharge appeared at the point of inoculation, in which, with difficulty, a few of the bacilli of Nicolaier and Rosenbach were discovered amongst numerous other bacilli and micrococci.

A guinea-pig inoculated with a cultivation of blood taken from the wound died of Tetanus in twenty-four hours. A hemorrhagic exudation very rich in micrococci appeared at the point of inoculation.

One drop of this exudation inoculated into the loins of a small pig produced Tetanus in twenty-four hours, which commenced in the posterior limbs, gradually extending forwards. In the pus at the point of inoculation the bacillus of Nicolaier was discovered.

Particles of earth and bits of straw had been discovered in the wounds of the man dead of Tetanus.

A. A small portion of this débris was introduced under the skin of a guinea-pig, causing death from Tetanus the third day. The pus at the point of inoculation contained a number of different organisms.

B. A second guinea-pig inoculated with a drop of this pus died in twenty-four hours. In this there was but little pus at the point of inoculation.

C. A large rabbit inoculated with a drop of pus from this last guinea-pig died in twenty-four hours with Opisthotonos and Trismus.

D. A guinea-pig was inoculated without result with the spinal cord of the guinea-pig A.

E. A rabbit was inoculated with a drop of pus from the rabbit C. Two days afterwards the classic symptoms of Tetanus were present, and death ensued the same evening.

F. A rabbit inoculated subcutaneously with a cubic centimetre of water in which the earth adhering to the wounds of the man had been mingled, gave no result.

G. A rabbit inoculated with a culture of this earth six days old, died of Tetanus on the third day. This culture contained the bacillus of Nicolaier and Rosenbach.

These facts seem to point out that Tetanus, as induced from earth, by Nicolaier, and that, the result of wounds, is different.

It has also been remarked that inoculations made with material obtained from wounds to which antiseptic agents had been applied (carbolic acid, or Lister's corrosive sublimate gauze) gave no results, which fact, as the author remarks, points out the great importance of antiseptic dressings. It appears that the infection is entirely local, as no results were obtained from inoculations from the blood or spinal cord of the man, or the animals that died, which fact has already been noticed by Bonome. This varies from the results of Rosenbach, who found the characteristic bacillus in the spinal cord in four out of a hundred cases.

The conclusions Giordano arrives at are, that although we have not yet been able to isolate the specific bacillus that causes the disease, still we have proved that Tetanus is due to a micro-organism, is infectious, local, inoculable, and transmissible from man to animals, and from one animal to another, both directly and after culture.

SOME OF THE RELATIONS OF VETERINARY TO SANITARY SCIENCE.*

BY ARCHIBALD ROBINSON, F.R.C.V.S., GREENOCK.

MR. CHAIRMAN AND GENTLEMEN,—Your worthy President—with whom, before his removal to Paisley, I had many pleasant and interesting business associations—has long been anxious that I should address you upon a disease in the prevention of the spread of which he became greatly interested

* Read at the Thirteenth Annual Meeting of the Sanitary Association of Scotland, held at Falkirk, 14th October, 1887.

while we were associated in Greenock. That disease, gentlemen, is Tuberculosis. After much pressure I consented; but in turning the matter over in my mind, I thought that to read a paper entirely on that subject would, from being necessarily very technical, scarcely be of sufficient general interest to your members. I have, therefore, decided to make the subject of my remarks "Some of the Relations of Veterinary to Sanitary Science."

While we of the veterinary profession have a sanitary science which may be regarded as peculiar to our profession—interesting only to our patients, our clients, and ourselves—we have also a sanitary science which interests, or ought greatly to interest, the public in general.

The communicability of certain diseases from animals to man has long been recognised, and it is in this direction that I would more particularly desire to draw your attention to some of the relations of veterinary to sanitary science. Some of the diseases communicated from the lower animals to man are not only loathsome, but exceedingly fatal. There is one disease, however, which, when transmitted, is not only extremely benign—viz., Vaccinia (or Cow-pox)—but also confers immunity from another terribly malignant disease, viz.—Variola or Small-pox. We are indebted—if not for the discovery of this fact, at least for its application—as you are no doubt all aware, to the immortal Jenner. The discovery, however, of the attenuation of the rabific virus—which, when inoculated, gives immunity from Hydrophobia without apparently inducing any symptoms of disease—quite eclipses, from a scientific point of view, the discovery of Jenner. For this we are indebted, not to a physician, but to the renowned French chemist, M. Pasteur; and it would seem, according to some authorities, that we are in some way indebted to the French for the Vaccinia discovery also.

It is stated that it was well known in the South of France that the girls attending cows and getting inoculated with the (picote) Cow-pox were proof against Small-pox, and that in 1798 this was communicated by a Frenchman, called M. Rabault, to an Englishman, Dr. Pew, a friend of Jenner.* Be this as it may, the credit is due to Jenner of having utilised the knowledge, not only to the benefit of his countrymen, but to millions of others. Jenner also stated that attendants on horses suffering from Grease, or Sore-heels, by getting inoculated, suffered somewhat severely as the result, but were afterwards proof against either Small-pox or Vaccinia. Jenner was perfectly correct in his observation, but was unfortunate in the selection of the word "Grease," which is recognised as an inflammatory condition of the skin of the limbs, especially about the heels (with eruption and fœtid discharge), commencing generally in the sebaceous glands, and is known as "Eczema Impetiginodes," or called by some "Steatorrhœa or Erysipelatous Impetigo."

He mistook the eruption of the specific fever of Horse-pox, the eruption of which, although not generally confined to the heels, is easiest seen there and about the lips and nose, where the skin is delicate. This error in nomenclature of Jenner led to errors being perpetrated for over half a century all over Europe, for endeavours were made in different countries to inoculate the cow with the discharges of greasy-heeled horses. The Horse-pox of the horse, however, without doubt, if not the origin, is capable of producing Cow-pox, as was perfectly demonstrated by Loy, Jenner's contemporary and co-operator; but he unfortunately, while recognising it as a specific disease, still associated it with the names "Sore-heels" and "Grease."

As the result of this, discussion followed discussion, with but little advantage until 1862, when a prolonged controversy took place in the Academie des Sciences, in Paris, on the origin of Vaccinia in the horse. The discussion

* Since writing the above, I find that Jenner must have been acquainted with the protecting power of Vaccinia long prior to 1798.

at this time arose out of the report, by M. Bousquet, on the work of a commission instituted at Tolouse to study the question.

Although the commission was decided that the disease of the horse which transmitted on this occasion Cow-pox, when inoculated, to bovines, was not Grease, it was still maintained by many that it could be inoculated from Grease also. My old and much revered teacher, M. Saint Cyr, of the Lyons Veterinary School, strongly opposed this, as being entirely contrary to and incompatible with the laws of nature and with the established principles of medical philosophy.

The questions of interest in these discussions, however, were not confined to the origin of Vaccinia, but amongst many others, the most important was its relationship to Variola.

Whilst the academy and the medical and veterinary journals were engaged in arguments as to the identity or non-identity of Cow-pox and Small-pox, M. Chauveau, the celebrated pathologist, and teacher at that time in the Lyons Veterinary School, was, with the assistance of MM. Vennois and Meynet, busy at the far more serious and useful work of experimentally proving what others were vainly endeavouring to solve by argument upon almost entirely hypothetical basis.

In April of the year 1865, M. Chauveau issued his report to the Society of Medical Sciences of Lyons, in whose name the experiments had been carried out, under the title of "Vaccinia and Variola: New Experimental Study on the Question of the Identity of these two Diseases."

These experiments were carried out upon a vast number of animals of different species—viz., the ox, man, horse, ass, sheep, goat, dog, and pig. After some very interesting introductory remarks, Professor Chauveau divides his report into two chapters. The first he devotes to Vaccinia and the second to Variola.

The first chapter is divided into five articles. Article I. treats of the transmission of Vaccinia in the bovine species—primitive Vaccinia or Cow-pox. Article II., of the transmission of Vaccinia in bovines that have suffered from Foot-and-mouth disease, and of the relations that exist between that disease and Cow-pox, or primitive Vaccinia. Article III., of Vaccinia in the human species—comparison and relations with primitive Vaccinia. Article IV., of Vaccinia in the equine species—comparison and relations with Cow-pox and human Vaccinia. This article is divided into three paragraphs, which consider—

1. The inoculation of Cow-pox to the equine species; comparison of inoculated Horse-pox and Cow-pox.
2. Horse-pox produced by the inoculation of Cow-pox and re-inoculated to the bovine species.
3. Horse-pox, produced by the inoculation of Cow-pox, is inoculated to the human species. Transmissions, crossed in man, the horse, and ox, executed comparatively.

Article V. treats of the vaccination of the goat, dog, pig, and sheep.

The second chapter, devoted to Variola, is divided into three articles.

I. Inoculation of animals of the bovine tribe, and considers what happens—

1. When human Variola is inoculated to animals of the ox tribe.
2. When Variola is introduced into animals already variolised.
3. When Variola is introduced into vaccinated animals.
4. When Vaccinia and Variola are simultaneously inoculated.
5. When the variolous virus is transmitted from ox to ox.
6. When man is inoculated with the variolous virus which has been passed through the organism of the ox.
7. When the same variolous virus is transmitted from man to man.

8. When it is again taken from man to the ox.

Article II. treats of human Variola inoculated to the equine species, and contains nine paragraphs, consisting of—

1. Experiments on the general and local effects produced by the inoculation of Variola in the equine species.
2. Experiments on the inoculation of Vaccinia in horses previously variolised.
3. Experiments on the inoculation of Variola in horses previously vaccinated.
4. Experiments on the transmission of Variola from horse to horse.
5. Experiments on the transmission of Variola from the horse to the ox.
6. Return to man of Variola from the horse.
7. Cultivation in man of variolous virus taken from the horse.
8. Return to the horse of equine variolous virus cultivated in man.
9. Transmission to the ox of equine variolous virus cultivated in man.

Article III. finishes the report with a discussion of the work of other authors.

Now, gentlemen, I do not mean to weary you with details of these interesting experiments, nor even with a review of the various articles; but I merely enumerate them to give you an idea of the extraordinary magnitude of the work undertaken by Professor Chauveau, whose name you will doubtless admit is a certain and sufficient guarantee for scrupulous exactitude in its performance. To be brief, then, these experiments show beyond doubt that, while Variola bears, when inoculated to animals, the same relation to Vaccinia that Vaccinia, when inoculated to man, bears to Variola, they are not one and the same disease. That is to say, that Variola, when inoculated to animals, produces even a milder disease than Vaccinia in animals, while Vaccinia produces a milder disease in man than Variola. That Vaccinia is not infectious by atmospheric conveyance either in man or animals, while Variola in man is. That no amount of passage of Variola through animal will transfer it into Vaccinia, and that, no matter what attenuation of the virus may be effected by such passage, it is still Variola that is inoculated, and consequently, as his experiments prove, a disease capable of propagation by infection. Also that, while the diseases are distinct, they bear the strongest possible relationship to each other, for, while man resists Variola when vaccinated, animals *variolised* (if I may be allowed the expression) resist Vaccinia, and when vaccinated resist Variola for a period of time. Gentlemen, I would like to insist on this point, for there seems still to exist in the medical profession of this country a large number who believe that Vaccinia is simply attenuated human Variola. Chauveau's experiments, which do not appear to be as well known in this country as they merit, prove beyond doubt that such is not the case.

It may be well for me to mention—in case any doubt should be entertained as to the result of the experiments carried out under Article II. of the first chapter—that the experiments proved that no relationship exists between Foot-and-mouth Disease and Vaccinia, as had been alleged by M. Depaul and others.

The existence of the almost invariably benign disease, Cow-pox, is known to almost every one in this country; but the existence of Horse-pox does not seem to be so well known. During my comparatively short career (about fifteen years), however, a number of cases have occurred in my practice, and indeed within the last month two have come under my care. By far the most interesting occurred about ten years ago, when a horse belonging to the late Mr. Robert Warden, of Finnart, suffering from the well-marked general eruption of Horse-pox, was brought to our premises by the ploughman, who, on being informed that the horse was suffering from Horse-pox,

seemed rather sceptical. On being warned that if he got inoculated he might also suffer from Horse-pox, he was still more sceptical, and seemed to look upon the Horse-pox as being quite a joke. It happened, however, that he did get inoculated, and as he is now with Mr. Orr, of Craigieknowes, in Greenock, he has just refreshed my memory on the subject. He says his name is Charles M'Carrie, and, to use his own expression, ten years ago he was thirty-five years of age, and had been healthy since childhood, when he was vaccinated. While attending a cart horse, between five and six years old, of Mr. Warden, he got inoculated by a wound on his hand and suffered a certain amount of malaise (in his own language, "was kin' o' hingin'") for three or four days, when a large pock commenced to make its appearance. The left arm got corded, and a swelling commenced under his armpit, which acquired the size of a pigeon's egg. About the same time he noticed a papule of similar dimensions on the same part of his right arm, and several came out on his back and some smaller ones on his breast and body, as well as one on the point of his nose. For two days he was very sick and feverish.

The eruption passed through the usual stages and desquamated in the usual way, except the one pustule on his left arm, as large as a sixpence, which got accidentally knocked off, discharged a quantity of citrine coloured fluid, and was long of healing. The cicatrices are perfectly visible, and will doubtless remain so as long as he lives.

Although, as shown by Chauveau's experiments, Horse-pox and Cow-pox are identical diseases, the inoculation of the virus of the spontaneous or naturally-developed disease to the human subject, seems to be much more severe than when the disease has been inoculated to the horse from the cow and then transferred from the horse to man. This has also been recorded by Professor Bouley, who witnessed a student suffer pretty severely, as the result of inoculation from a horse affected with spontaneous Horse-pox, which had been the subject of a surgical operation, and in dressing the wound the student got inoculated.

It is very probable that the inoculation of spontaneously-developed Horse-pox virus* would prove the most effectual preventative of human Variola, but there is the risk of, at the same time, inoculating Glanders, which is a most loathsome and fatal disease to the human species. It has, however, been shown that the ox is the animal whose system is most capable of regenerating human vaccine, which loses much of its potency by passing through repeated generations of mankind. This, in the light of recent scientific investigations, is one of the strongest arguments against the identity of Vaccinia and Variola. For it has been shown that the passage of certain viruses through the system of certain animals increases the power of these viruses, while the passage through certain other animals diminishes their power. Consequently, were Variola and Vaccinia one and the same disease, the virus of both would be increased by passage through the ox, while, in reality, that of Vaccinia is increased and that of Variola is diminished by passage through the organism of the ox.

Now, gentlemen, there is at the present time a considerable cry against compulsory vaccination, and while my sympathies certainly do not run in favour of those who denounce the State for the enactment of laws which have undoubtedly been of immense benefit to humanity, and of which the repeal would indeed be a grave misfortune, still, it seems to me, that when the State does enact laws of this nature, it ought to see that their enforcement be carried out with the smallest possible risk to those on whom they

* By spontaneous Horse-pox is meant Horse-pox the result of natural contagion, not developed experimentally.

operate. Instead of some medical men lending themselves to this popular cry against vaccination, it would be well for them to turn their attention to the manner in which vaccination could be carried out absolutely without risk of infecting the vaccinated with other diseases. That those who raise their voices against vaccination, as at present carried out, are justified by so doing, there can be no argument to dispute, and, it appears to me, that while all thinking persons acquainted with the subject must be its strongest partisans, under proper sanitary conditions, they cannot but protest, in the most pronounced terms, against a system attended by innumerable dangers that could easily be avoided. If the State requires that my child should be vaccinated, which it has a perfect right, not only as a protection to itself, but to others, on the other hand, an equal right appertains to me to demand that the State employ only such lymph as can be proved to contain no other germs than those of Vaccinia. In the present condition of things, Tuberculosis from either man or the ox, Syphilis from man, and probably a thousand ills we know not of, may accompany the lymph employed. The remedy for this can, to my mind, only be suggested by some such method as the following:—

1. Establishment by the State of emporiums for the *manufacture* and sale of the lymph.
2. That only bovine lymph be used.
3. That the bovines employed do not exceed two years of age.
4. That each yield of lymph be numbered with the same number as the animal from which it is obtained.
5. That such lymph be not issued until such time as the animal from which it has been drawn is slaughtered and a careful *post-mortem* examination made.
6. That such examination be made by a properly qualified and specially appointed veterinary pathologist.
7. That, in the event of *any disease* being present, the lymph corresponding to the number of such animal be destroyed.

By such a method there could be no risk of communicating any other disease than the one desired—viz., Vaccinia, and the expense would not necessarily be great, as the Vaccinia to which the animals had been subjected would not deteriorate the flesh, which could afterwards be sold for food.

The assertion that Tuberculosis or Consumption may be communicated with vaccine lymph is not a mere supposition, for its possibility has been experimentally demonstrated by M. Toussaint, professor in the Veterinary School of Toulouse. He inoculated two-year-old heifers with tubercle virus on 15th Ootober, 1881, whose *post-mortem* on 10th February, 1882, revealed general Tuberculosis. After their inoculation with tubercle virus they were inoculated with Horse-pox virus, and the serum from the pustules produced, on being inoculated to twelve rabbits, gave rise, in six of them, to Tuberculosis.

Unfortunately, gentlemen, this is only one of the many ways in which this terrible malady, Consumption, may be produced. It has been experimentally and accidentally communicated over and over again, from man to animals and from animals of one species to another. Experimentally, it has most frequently been induced by inoculation or by the ingestion of portions of organs containing lesions of the disease. Accidentally, numerous cases have been recorded of dogs, cats, and fowls becoming consumptive from licking or picking up the expectorations of consumptive persons. It is also highly probable that many cases of infection occur in man and animals from inhalation of the bacillus when desiccation of the expectorations take place and the particles get suspended and float like dust in the atmosphere of sick rooms or byres. Sexual intercourse, and the use of spoons, glasses, or other vessels

from which consumptive persons have been feeding, may be considered other probable modes of accidental contamination, but that which interests us most and is, perhaps, almost as prolific a source of conveyance as any is the use, as food, of the flesh and milk of tuberculosed animals. As has been stated, the proof of transmission from man to animals of Tuberculosis is abundant, and, to most minds, the conclusion would be that the converse was equally practicable, but there are many who seem adverse to admit anything which is left to hypothesis, no matter how conclusive, and in view of the value of human life and the incurable nature of the disease, an experiment on the human subject could be looked on as little short of wilful murder. The admitted fact that man is a favourite subject of this disease, which can be transmitted from him to the lower animals, is to my mind sufficient to show that the disease is equally easily induced in him by transmission from the lower animals. There are, however, some cases recorded of accidental transmission of the disease in which the contamination has been so palpably traced from animals to man that the conclusion that the disease is so transmitted is irrefutable.

Dr. de Lamallerée gives the following interesting observation in the *Gazette Medicale* of the 15th August, 1886:—

"The hamlet of C. contains about ten habitations, which, from a hygienic point of view, are all that could be desired. Situated about 1,500 feet above the level of the sea, on the southern slope of a cultivated hill in the middle of a large forest, the ground is good and the air pure and invigorating.

"The little population consists of farm labourers and foresters, of natures robust and healthy like the air which they respire.

"The diseases of cities are unknown in C. In the memory of man death has only occurred from old age, Pneumonia, or accident. In 1872, a young man, M., returning from captivity in Prussia, after our disastrous campaign, comes and settles at C. as a labouring forester. At that time he suffered from Bronchitis, which he had contracted during the war, and of which he had not been able to recover. He married a young and vigorous girl of the neighbourhood, twenty-five years of age. Nine months after marriage she had a son. A short time after marriage M. had a first attack of Hæmoptysis, followed by several others at short intervals. Briefly, he died phthisical two months after his son was born. M.'s wife had assiduously attended her husband, never leaving, so to say, their only apartment, not too well ventilated either, which formed their common dwelling. Some time after weaning her child she had as the result of a chill, she said, an attack of Bronchitis, which became chronic, and little by little the signs became apparent of pulmonary Tuberculosis with the usual train of symptoms. The child was difficult to rear, and has attack after attack of Bronchitis; actually he is the perfect specimen of a child suffering from hereditary Tuberculosis.

"For the last two years the mother has cavities in her lungs, which enlarge slowly and provoke in her the abundant expectoration of the phthisical. There is every evidence of a rapidly approaching fatal termination.

"Quite recently I was called to another house in the same hamlet to attend a young woman living at some distance from the woman M., and I must admit that I was much surprised to find in this woman symptoms of the first stage of Pulmonary Phthisis. I had previously known her to be possessed of a robust constitution, twenty-nine years of age, and free from any diathesis. Consequently, I sought minutely for the cause that could have determined the appearance of tubercle in this woman, who had very seldom visited the woman M., and had never either ate or slept in her house. Here there was evidently contagion which must even have come from the neighbouring centre, but by what route? After many and fruitless inquiries, I at last

learned that the woman B. had eaten eleven fowls which had died at the woman M.'s, in the space of three months; and that, still more feeling her strength diminishing, she had cooked them very slightly, believing that she would derive more nourishment from eating the bleeding flesh.

"I had recently been reading the observation concerning the young man at the Alfort Veterinary School, who, being himself phthisical, had contaminated by his spittles the poultry yard of that school; as well as the observation published by M. Vallin in the *Revue d'Hygiene*, also treating of the contagion of human Phthisis to fowls. Had I not before me a further confirmation of the fact, contrary to the opinion of M. H. Martin? Under the influence of that idea I hastened to the house of the woman M., to satisfy myself as to the mode of death of these fowls, and learn whether they swallowed her expectorations. On this last point I was thoroughly satisfied, and without trouble; for in approaching the house I heard her cough, and at this signal a whole troop of fowls hurried to the open door, absolutely as they do in our country at the voice of the woman who carries them their repasts. These fowls were pressing round the edge of the bed of the invalid and quarrelling over the sputum.

"One of them had died that morning. I caused her to give it me, and immediately proceeded to make a *post-mortem* examination. The intestine was the seat of seventeen softened tubercles, disseminated through its whole length, and the liver was farcied with them. This unfortunate fowl was emaciated to the last degree, and for several days had scarcely been able to walk. The purulent matter in the tubercles of the liver contained a great number of tubercle bacilli. This fowl, then, being tuberculous, I considered myself justified in concluding that the fowls which had previously perished after exhibiting the same symptoms were equally so. Therefore these fowls must have been the vehicle of contamination, by the bacillus Tuberculosis, to the woman B., who ate them. From the moment that it is admitted that contagion may result from simply eating out of a plate or drinking from a glass which is being used by a phthisical subject, there is every reason to admit the possibility of inoculation by eating an aliment which is charged with the bacilli. That aliment, being only half cooked, could not have been deprived of the microbes which it contained; it had conserved all its potency, and played the part here of the inert envelope of certain pharmaceutical preparations which invest an active principle, and mask its flavour only to permit the more easily of its ingestion. The bacillus, once in the economy, is, according to the admitted doctrine, taken up by the circulation, and, after having chosen a favourable territory, implants itself and there develops, producing those physiological and organic disorders which are peculiar to it. In the present instance its election of domicile is the lungs, the favourite territory of Tuberculosis in man. Four months have only been necessary for it to give rise to such disorders that its presence could with certainty be affirmed by clinical examination alone. In fact, the stethoscopic signs furnished by the woman B. could not leave the slightest doubt as to the tubercular nature of her chest disease.

"REFLECTIONS.—In this case is found the triple contagion of Tuberculosis—

"1. From man to man.

"2. From man to the animal.

"3. From the animal to man.

"Contagion from man to man is in science an accomplished fact. The contagion from man to animals has been admitted by many authors; others have pretended that certain animals were refractory to inoculation. Among other, M. H. Martin has pleaded in favour of its innocuousness to fowls.

"I have cited the above two cases, and now bring a new one to prove the greater aptitude of fowls to become tuberculous by means of contagion than

even dogs or cats, etc., as shown by numerous other observations. The contagion from animals to man is in reality sufficiently demonstrated. In the case which I have described the vehicle which transports the bacillus is different. In fact, until now contagion by means of cow's milk has been almost exclusively the question occupying attention.

"I admit that very few people in easy circumstances run the risk of tubercular contagion; but in our poor parts of the country, where the peasants—less delicate than the citizens, and perhaps more interested—wish to lose nothing, hygiene demands that great attention be given to fowls destined for food. And, moreover, a question meriting elucidation is, whether a fowl, at the onset of Tuberculosis, is not capable of affecting he who partakes of it; and, further, what heat in cooking is capable of destroying the bacillus.

"In any case I would recommend from to-day, as a simple hygienic measure, to carefully remove the liver, the digestive tube, and the lungs of fowls before cooking, and to absolutely reject suspected fowls.

"By these means a danger—sometimes imaginary, but unhappily in many cases real—would be avoided."

This, gentlemen, as nearly as possible *verbatim et literatim*, is the communication of Dr. de Lamalleree.

(*To be continued.*)

THE ANIMAL ALKALOIDS.

THE mysteries connected with the phenomena of health and disease have been elucidated with great rapidity of late. Little more than ten years ago Koch conclusively proved that there was an intimate relation between bacteria and epidemic and contagious diseases; but wherein that relation consisted was not so apparent. The mere presence of bacteria in the body did not seem necessarily to indicate a state of ill-health; on the contrary, it was even asserted that certain species were of essential service in the vital economy. Now we have got a step farther. The recent investigations of French and Italian *savants* seem to show that the direct cause of the diseases connected with bacteria is to be sought in the alkaloids which are the waste products of these organisms. It is said that if these alkaloidal products are allowed to accumulate in the system, either through inefficient elimination by the excretive organs or through disease of those organs, they cause ill-health, and in extreme cases death, in the same way as other poisons.

The word "alkaloid" is used in chemistry to denote a class of substances having alkaline properties—that is to say, having in some degree the qualities which alkalies, such as soda and ammonia, possess, of being soluble in water and combining with acids to form salts. The alkaloids are remarkable because of the powerful physiological effects which they are capable of producing upon the animal system when absorbed by it. Some of them, such as nicotine and curarine, are among the most powerful poisons known; others, such as quinine, are invaluable medicines. Their generic name, derived from the Arab "kali," denotes a plant connection—indeed, until recently it was thought that the vegetable kingdom was the only source whence these substances were derivable. Accordingly, though from time to time certain alkaloidal substances were detected in animal excrementa and tissues, the importance of the discovery was negatived by the supposition that they got into the system during life through the consumption of vegetables or medicines. But the recent researches of Armand Gautier appear to show not only that alkaloids are formed in the animal system as the result of bacterial fermentation, but also that the vital cells of the animal are, quite independently of

such bacterial action, themselves capable of elaborating alkaloids. So henceforth it may be convenient to distinguish alkaloids into two classes—namely, vegeto and animal—and to subdivide the animal alkaloids as Gautier does, into those due to the action of bacteria on the albumenoid substance of the tissues (*ptomaines*) and those elaborated by the vital energy of the cells themselves (*leucomaines*). Let us try to make this latter division more clear.

The vital process has been aptly likened to a slow continuous burning. In the living body fresh fuel, as it were, must be frequently added in order to supply the place of the waste material which the burning process entails. To speak more correctly, there is going on in every living cell which helps to make up the animal body a constant transformation of energy. Now, this transformation cannot take place without certain modifications of the material substance of the cell. The prime mover here is oxygen, which by acting upon the cellular material burns it up; at the same time giving off carbonic acid, urea, and other substances, which, if not cast out of the system, would poison it, and ultimately destroy its vitality as a whole. Hence the necessity of the excretive functions having free scope. But Gautier asserts that oxygen is not the only cause of this transformation process. He affirms that nearly one-fifth part of the life of the larger animals is what Pasteur has termed *anaerobic*—that is to say, deriving its force-vitality from internal modifications brought about independently of the help of oxygen. As the result of this anaerobic life of the vital cells, we arrive at the aforesaid leucomaines. If this fact is kept in mind, the origin of the ptomaines will be more easily understood. Pasteur's researches, as well as those of other scientific inquirers, have shown that anaerobic life is a characteristic of the lower orders of bacterial ferments, and that oxygen is not essential to their existence. And just as the vital cells elaborate leucomaines, so these bacterial ferments, feeding on the albumenoid substance of the body and causing what is known as putrefaction, develop ptomaines as their waste products.

The history of the discovery of the animal alkaloids is a remarkable one. The first to recognise the connection between the presence of ptomaines in a dead body and the processes of putrefaction was the Italian toxicologist Selmi. While examining a body for medico-legal purposes, he detected in the tissues an alkaloid not corresponding to any previously known. This was soon after followed by a similar observation; and Selmi was led to the hypothesis that these alkaloids were the result of bacterial fermentation after death. Further inquiry confirmed him in this supposition; and in 1872 he published his belief that really organic substances, similar in constitution to the vegeto alkaloids already known, were invariably elaborated in dead animal matter during the processes of putrefaction. In France, at about the same time, Gautier was engaged in independent researches with similar results. He observed that albumenoid substances, if left to putrefy, strongly developed ammoniacal characteristics; and he ultimately succeeded in extracting alkaloidal substances in small quantities from the fibrine of the blood. Later still, Selmi extracted two new alkaloids from pure albumen which he had caused to undergo putrefaction free from atmospheric contact; this conclusive experiment he announced in 1877. Since that date one ptomaine after another has been discovered, each fresh observation making the cause of their origin more clear; until at last, in 1885, Gautier made the crowning announcement regarding the formation of leucomaines in the vital cells of the body. About the same time this diligent investigator made some experiments on the muscular juices of the higher animals, which resulted in the discovery of five new alkaloids.

No doubt there is still ample room for inquiry; but Gautier's explanation of the part which these alkaloids play in the animal economy impresses one

as being substantially correct and only needing future discoveries to confirm it. As to the connection of the ptomaines with bacterial fermentation there is strong proof; for when animal matter has been examined with a view to their extraction the quantity found has varied proportionately with the number of bacteria present. Again, as to the poisonous character of both ptomaines and leucomaines there is no doubt; for when injected into birds and other animals even an extremely minute dose has been sufficient to cause death. Moreover, the symptoms, which preceded death in these experiments were thoroughly characteristic of poisoning by putrid animal matter—namely, diarrhœa, intestinal inflammation, dilatation of the pupil, loss of muscular power, and convulsions.

Many physiological phenomena which have baffled explanation appear perfectly natural in the light of Gautier's description of the vital processes. Cases of poisoning symptoms induced by the consumption of certain kinds of food—such as mussels, whelks, sausages, and the like—are of frequent occurrence. Instances of death having ensued upon such symptoms are by no means rare; and yet the actual cause of death, the precise poison at work, has never been discovered or defined. Now we have some light on that point. Further, we can more readily understand how it is that a long fatiguing walk may induce, in one who has for some time previously had little exercise, symptoms similar to those of Typhoid Fever. So, too, we need not look for a specific microbe to account for the presence of Typhus Fever amongst an army in the field; sometimes it may be explained as the result of auto-infection, induced by over-accumulation of alkaloids in the system. Another remarkable thing about the discovery is that it points to a close similarity, if not identity, between the vital processes of the vegetable and animal kingdoms. Lastly, it is yet more apparent that we could not live if we had not also the seeds of decay in us; that the very act of living entails the destruction of the living substance; that verily in the midst of life we are in death.—*St. James's Gazette.*

THE HYPODERMIC INJECTION OF EXTRACT OF MUSTARD.

At a meeting of the *Société Centrale de Médecine Vétérinaire*, M. Cagny drew attention to the fact of the employment of mustard having assumed so much importance as a *revulsif* (counter irritant), that it must be of interest to endeavour to facilitate its use and render its effects sure and constant. Mustard powder, when fresh, and even when deprived of its oil, requires, in order to produce its effects, to be applied by an experienced hand. Sometimes its action is little apparent, and at other times it exceeds that which the practitioner expected. But these inconveniences disappear in employing, by hypodermic injection, Savary's liquid mustard. Its effect is sure and rapid, while its intensity is entirely in the hands of the veterinary surgeon, who may at will limit the œdema which he desires to obtain.

The results which M. Cagny had derived from the employment of Savary's liquid mustard he laid before the notice of the members; though he had some time ago drawn attention to the value of this article for the cure of umbilical hernia. With regard to the *modus faciendi*, he employs the extract hypodermically, by means of the ordinary Pravaz syringe, by first taking up a large fold of skin at the part where he desired the œdema to form, pulling it outwards so as to stretch or tear away the connective tissue beneath to the full extent of the space to be acted upon; then the needle of the syringe is pushed through, and the syringe emptied beneath the skin. A half-syringe full (equal to one to two grammes of the extract) is injected a short distance from the first, and these two injections are sufficient to produce an œdema about a

square decimetre in size. Three or four punctures are therefore necessary to involve the entire side of the chest.

The effect is soon visible, a matter of great importance when compared with the effect of ordinary mustard, which is slow to appear, and sometimes is not seen at all. But in the new method it is apparent almost immediately, ten minutes sufficing for its complete development. When compared with an ordinary sinapism, the effect of this is marked, as it gives as hot a swelling, but one which is less painful—the animal exhibiting scarcely any restlessness; in one instance only had Cagny witnessed uneasiness and a slight febrile condition. The œdema persists for a long time, and this is a valuable effect. In only one case out of thirty was there a small abscess, and here an entire syringeful had been injected on each side of the neck of a horse attacked with vertigo, the injections being repeated next day, the brief interval probably favouring the formation of abscess Cicatrisation, however, was rapid, and the traces of the accident were insignificant. Otherwise, in all the instances there has been no sloughing of skin or destruction of hair. The fluid has been injected indifferently into every region of the body, though Cagny remarks that it is preferable to apply it only to those parts where the skin is thin and loosely adherent.

He sums up the advantages of this procedure as follows:—

1. The liquid is absolutely unalterable, and its effects certain.
2. Its effects are produced almost immediately.
3. Saving of time. The practitioner can carry a small quantity of the fluid in his wallet.
4. Saving in expense, the cost being trifling.
5. No apparatus is necessary.

Cagny had employed it in vertigo and ophthalmia (applied to sides of neck); on the sides and front of the chest for thoracic and heart diseases; on the abdomen for Typhoid Fever, Enteritis, Colic, etc.; for umbilical hernia, in which three punctures were made around the tumour, which caused a voluminous swelling that was slow to disappear. Two cases had been most successfully treated in this way. With very large herniæ the injections might be repeated in about twelve days.

Reviews.

Inoculation for Rabies and Hydrophobia. By Surgeon-General C. A. Gordon, M.D. (London: Baillière, Tindall, and Cox. 1887.)

Dr. Gordon has been at the trouble to collate and compare with each other, opinions and statements bearing on the chief points in Rabies, with regard to the nature, prevention, and cure of that disease, about which so much has been written. He does not add a single fact or interesting observation of his own, and we are at a loss to understand the motives which impelled him to undertake such a task, as he leaves us no wiser than he found us, and deduces nothing from the facts, statements, and opinions with which he fills his book of 127 pages. From sundry indications we might infer that he belongs to the anti-vivisection and anti-Pasteurian parties, and the weight of his material certainly inclines in favour of these folks. Much of the nonsense and silly talk which has obscured the truth regarding the disease, together with the maudlin

sentiment which keeps it prevalent in our midst, and also much that is curious in its literature, are to be found in the book.

THE HORSE IN SICKNESS, AND HOW TO TREAT HIM. By J. COCKRAM. (London: L. N. Gill. 1888.)

This sixpenny pamphlet is recommended by the author, who appears to have been a cab or horse proprietor and manager. He announces that "it is penned with no feeling of hostility to the veterinary profession; on the contrary, owners of a large number of horses will do well to contract with 'vet's' for their services." There are some sensible hints, and some which are not sensible. With regard to the latter, we may give one instance. Speaking of a medicinal laxative to be regularly administered in a hot or cold mash on resting days, he says: "The best for the purpose is equal parts, by weight, of powdered antimony, sulphur, nitre, and gentian." Of this a table-spoonful is to be given. He alludes to horses being "unroofed" when receiving a bolus, through holding the tongue without, at the same time, grasping the halter. But really the production is altogether too crude and elementary, as well as obscure and limited, to be of much use even to amateurs.

BENCH BOOK FOR TEST TUBE WORK IN CHEMISTRY. By H. T. LILLEY, M.A. (London: Hamilton, Adams, and Co.)

This appears to be a very handy little book, written by one of the teachers at the Portsmouth Grammar School, for the use of those who are beginning practical work in chemical analysis. It is really a brief guide to lie on the bench, and enable the student to dispense with the use of a larger and more complicated book, in studying reactions by means of the test-tube. From its arrangement, simplicity, convenient size, and cheapness (only one shilling), it can be recommended to veterinary students who are working up chemistry, practically, in the laboratory.

STABLE MANAGEMENT, AND A FEW OF THE DISEASES OF HORSES IN INDIA. By W. S. ADAMS, Army Veterinary Department. (Madras: Lawrence Aylum Press. 1887.)

THE EQUINE DISEASES OF INDIA. By R. W. BURKE, Army Veterinary Department. (Jubbulpore: Star Press. 1887.)

These two works are of value to veterinary surgeons in India, to those who are likely to go to that country, and, to some extent, to those at home. Mr. Adams' contribution contains good articles on such subjects as feeding and exercise, skin diseases, Colic, Filaria papillosa, valerian as a tonic, Paraplegia, Lymphangitis, and Spavin, and is evidence of the skill and assiduity with which he is applying himself to the study of his profession. The article on Spavin, illustrated as it is by some good drawings, particularly merits notice. In the Equine Diseases of India, Mr. Burke treats of Surra, Anthrax, Kamri, Chiber, and Barsatti in an intelligent and interesting manner. Only one of these maladies—Anthrax—may be said to merit the particular attention of European Veterinarians, but the others are nevertheless attractive to pathologists, while a knowledge of

all of them is most essential to our colleagues in India, who find in them most serious disorders, three of which are generally beyond remedial measures. Mr. Burke deals with them in an able manner, and his references to Continental medical and veterinary literature in elucidating their nature, show the pains he has taken to accomplish his task in a satisfactory fashion. Recognising the difficulties army veterinary officers have to encounter in India, and particularly those due to overwork and an unfavourable climate, they deserve great praise when they devote themselves to the investigation of disease in that country, and publish the results of their labours. Surely such sacrifice must in time bring recognition of the value of veterinary science from the Indian Government.

Proceedings of Veterinary Medical Societies, &c.

LINCOLNSHIRE VETERINARY MEDICAL ASSOCIATION.

THE quarterly meeting of this Association was held at the Masons' Arms Hotel, Louth, on Tuesday, October 11th, the President, T. Greaves, Esq., Manchester, taking the chair. The minutes having been taken as read, the Secretary was instructed to insert the printed report in the minute-book.

Mr. Robinson, of Market Deeping, was proposed by Mr. MACKINDER as a new member, and being seconded by the Secretary (Mr. GOOCH), was carried.

Letters of apology were read from Professors Fleming and Walley, Messrs. Gibbons, Thurmaston; J. W. Gresswell, Peterboro'; M. N. Parker, Birmingham; T. Chambers, Dudley; Briggs, Bury; W. A. Taylor, Manchester; Wm. Woods, Wigan; H. Brooks, Long Sutton; Jas. Armstrong, Secretary to the Midland Association, Prof. J. McCall, Messrs. Hy. Brooks, Fulbeck; J. Roalfe Cox, London; W. Duguid, G. T. Brown, Hy. Howse, Prof. J. W. Axe, Sir Hy. Simpson, Messrs. H. Santy, W. A. Field, Jos. S. Carter, Bradford, etc., etc.

Those who had accepted the President's invitation to the meeting, and to dine with him, were Prof. Williams, Messrs. Faulkner, Manchester; Osborn, Fulbeck; Freer, Uppingham; Capt. Russell, Grantham; Messrs. Dickinson, Boston; Hartley, Lincoln; Hardy, Sleaford; Wyer, Donington; Axe, Doncaster; Mackinder, Peterboro'; Smith, Huntingdon; Spencer, Wragby; and Gooch, Stamford.

The PRESIDENT regretted they had not a larger attendance, as the sbuject for discussion was a very important one, and interested veterinary surgeons, and they could not have found a gentleman who had given the subject more attention. When he asked Prof. Williams to read a paper, he at once consented, and left it to them to choose the subject, and they had selected the one named. He had great pleasure in calling upon Prof. Williams, F.R.C.V.S., of the New Veterinary College, Edinburgh, to address them on "Diseases attendant on Parturition—the effects of retained and putrescent placental membranes, Metritis and septic Metritis."

Professor WILLIAMS said it was not his intention to deal with Parturient Apoplexy or ordinary Parturient Fever, but he intended to confine himself pretty much to what Mr. Greaves laid down for him, and he would first deal with the impervious *os uteri*, where there was no dilatation of the *os* at the time of parturition. He thought it occurred under three distinct conditions. There were three conditions which were associated with non-dilatation; when the labour pains came on there was some extent of dilatation, with an escape of fluid, but the *os* did not open as readily as it ought, and when the labour

pains were on, and there was a slight discharge of fluid, and one or two fingers could be carefully manipulated and inserted into the *os*. Perhaps labour pains came on when the animal had not gone its full time, and in these cases it was the duty of the practitioner to modify the labour pains and give time. He had known these cases go on for some days, and a calf born, the mother doing well enough, and in these cases labour pains might be modified by a large dose of opium or a subcutaneous injection of morphia or such like drug. He had never known this fail in these cases when the *os* was slightly open and there was a discharge. They found in other cases that the *os* was quite closed and there was no opening at all. There was no discharge of fluid, but by a careful examination of the uterus the contraction was ascertained to commence at the mouth of the uterus instead of at the horns. A careful examination of the fœtus manifested that it was going away from them, the labour commencing at the wrong end. The straining here might be very violent as the vagina and even the neck of the uterus would come into sight every time the animal strained. This tumultuous labour, as he had seen it in young animals at the first birth, and efforts at straining, might be overcome by a large dose of opium or chloroform, or a combination of the two, and they would have been applying pressure to the back, and so on. There were cases where the straining continued, notwithstanding this method of treatment, and it had been suggested, and he had once performed the operation of tracheotomy, where it was followed by the most admirable results in a mare. In woman chloroform could be administered, and a woman could give birth to a child, although tracheotomy were performed, but when an animal strained after tracheotomy there was no resistance. The glottis was open. In the case of chloroform there was no contraction of the glottis. The air escaped through the glottis in cases after chloroform, and in cases of tracheotomy it escaped through the tube. In cases where chloroform was not administered and where it would be thought to be dangerous to administer it, the operation of tracheotomy could be performed with very great advantage, as it at once modified this violent effort. A woman could give birth to a child, and in Edinburgh there was scarcely a woman who did so except under chloroform. A woman could expel the fœtus by the contraction of the uterus only. The abdominal muscles were not called into operation to such an extent as was necessary in the lower animals. By overcoming the action of the abdominal muscles by chloroform or tracheotomy they did away with the violent efforts of the mother. He had known this form of violent labour come on and the pains modified by opium, and the animal go on for another month, and then both do well. If the *os* was partly open by dressing it with extract of belladonna he had seen marked results follow. By dressing it two or three times in twenty-four hours there was a gradual relaxation and labour came on in a regular manner. Actual disease of the *os* was the third condition, and there they got a thickening of the mouth from a formation of fibrous tissue. This often arose from a cow having been hurt, and there was another form—a schirrous condition of the walls of the uterus. This disease often led to a fatal termination, and one thing they might carefully consider here to-day was whether they were justified in dividing the *os* in cases of this kind. In the old times, cases of non-dilatation were attended with very bad results. Scarcely a case ever recovered. There must be a careful examination of the condition. If there be actual thickening, an actual schirrous condition, preventing contractility of the mouth of the uterus, one must be aware of the appearance of the case before he proceeded to the operation. The *os* was sometimes divided in the woman, but it was said it was dangerous to proceed either upwards or downwards. If they divided the parts upwards they were apt to get into the rectum, though, if careful, not much harm would be done, but there was not so much danger in their cases. It was

done in the human being laterally, but if they did it, let them do it inferiorly. In their cases they might avoid injury, but there was very great danger if they performed the operation on the floor. There was great danger when the vagina was wounded on the floor. Fluids gained entrance and septicæmia might be set up. It must be done laterally if at all. He was strongly of opinion that instead of dividing the *os uteri*, they should resort to the Cæsarian operation. There was less danger in removing the fœtal membranes than through the *os uteri*. An animal that had real disease of the *os* should not be bred from again. They should be very careful to advise their clients not to breed from such an animal again. He had seen Gonorrhœa amongst a shorthorn herd; the cows and bulls all had it. A bull had served a lot of cows, and given them Gonorrhœa, and after some ten or twelve weeks they recovered. Bull No. 2 was also "clapped," and all the cows in the place I examined by speculum, and could see ulcers in the vagina and at the neck of the uterus. He told them not to breed from them, but they did, and most of them had to be destroyed. They had to consider the retention of the membranes, and Mr. Greaves had asked why the placental membranes were retained, instead of being expelled immediately after the birth. The fœtal membranes should be expelled in a natural manner shortly after birth, because some few days prior to the birth there was a degenerative change taking place between the fœtal membranes and the maternal placenta. The entire surface of the fœtal membranes and the digitations between the placenta undergo a degenerative process. This operation having taken place between the maternal surface on the one and the embryonic surface on the other, the juncture was broken down, and the uterus became loose and naturally expelled the fœtus, and birth took place in a natural way. The reason was simply that the degenerative change had not taken place as to cotyledons in the cow, and the placental surface in the mare, simply because the process of degeneration had not gone sufficiently forward. In some cases the cotyledons presented a diseased appearance. Fluids decomposed much more rapidly than solids, and if there were a fluid arising from the diseased surface it would decompose the material much more rapidly than a solid would. What were the effects of the retention of the fœtal membranes? His experience had been among very high-class Clydesdale mares, and he did not consider it dangerous to remove the fœtal membranes. He could tell them it was most dangerous to leave the fœtal membrane in the mare many hours. (Hear.) Within six hours he had seen decomposition take place, and the mare was far more liable to a septic condition than the cow. They had a septic condition in the course of a very few hours, great prostration of strength, great fever, pulse 130 to 140, and other conditions, and in the course of a short time symptoms of acute Laminitis. He considered this due to blood-poisoning by absorption into the circulation. Laminitis was one of the symptoms of blood-poisoning, and he had no hesitation in saying it was due to the absorption of septic matter into the circulation, causing inflammation of the feet. The professor described the conditions giving rise to this disease of the feet from septic absorption. He was of opinion they could not be too quick in removing the fœtal membranes from the mare, but it must be done very gradually and at a period of active contraction. If they could then assist nature in expelling the membranes, they would do it much more easily. The uterus of the mare contracted very firmly on the membranes, but the operation could be assisted by a large dose of warm water with Condy's Fluid. In the cow, some practitioners never removed the placenta, and they said they did well enough, but he held they should be removed by the fourth or fifth day. The uterus of the cow remained flaccid, and on introducing the hand there was a great cavity, which they could explore. He was certainly an advocate of removing the fœtal membranes in the cow as well as the mare. There was no such danger in a

cow, but they would find an improved condition. The best method, after assisting nature to expel the membranes, was to explore and find if all had been removed. Sometimes there was only some fluid resembling a thick gruel covering the surface of the mucous membrane. He used Condy's Fluid or carbolic acid for cleansing it well. He sometimes dissolved five grains of corrosive sublimate in a couple of quarts of water, and injected it into the uterus, and he had found this useful in cases where Laminitis had actually set in. As to Metritis there were cases of inflammation of the uterus in the cow independent of an injury inflicted during parturition. He happened to be at Mold, in Wales, and he had an opportunity of seeing many cows with acute Metritis actually going on the road immediately after the act of parturition, whether they had cleansed or not, being rapidly driven to the railway station. He remembered one case in which an animal became delirious, and finally got into a comatose state. After the act of parturition, the animal being rapidly driven, exhaustion set in, and this was quite sufficient to produce Metritis. When a cow was rapidly driven in this condition, everything was favourable to the reception of the septic germ, and it was the septic condition that brought the disease in this way. He thought it was also due to the rapid sucking of air. This sometimes destroyed life before any septic condition took place, and the animal died in the course of a few hours the second day or so after parturition. He recommended the administration of opium or some other anodyne in order to relieve pain, and after the cleansing process use the ordinary disinfectants. He had had a great deal of experience among sheep, and was considered a very fair sheep doctor, and had seen a good deal of septic Metritis in sheep. It commenced by inflammation of the uterus, generally through an accidental injury. In Scotland ewes lambed in sheds, and if the sheep died there it was skinned; and sheep would also be killed in these sheds and the skins put on the railings and allowed to dry. The sheep were surrounded by an atmosphere tainted with septic germs, and could it be wondered that sheep accidentally injured imbibed the poison and became a source of infection to others? It was true that when there was no inflammation the resisting power to infection was something remarkable. Injecting fetid matter into the healthy subject could not induce septicæmia, but a very small quantity into an inflamed spot was sufficient to induce septicæmia. Immediately the membrane was inflamed, it became more subject to the action of the septic germs, and septicæmia set in, with its evil results. One cause of the sheep, the ewe, having inflammation of the uterus was being subject to the germs, and the germs exhaled by the animal tended to spurious parturition, and the disease, which in the first case arose in non-contagious cases, now became a contagious one. If one ewe had the disease amongst a flock, there was no telling the end of it. Then shepherds would not touch a ewe unless he had carbolised his clothes, for if he touched another ewe, that ewe was certain to have the disease. In connection with this disease in ewes there was a form of septicæmia of lambs, and lambs became black, similar to Black-leg. It extended down the hind quarter, and one remarkable thing about it was that lambs did not take it after the fifth day. The morbid material was introduced through the umbilical cord, and when the cord dried, the morbid matter could not be introduced into the lung. He recommended the use of strong carbolic oil, as it had been attended with very remarkable results. They had other difficulties associated with parturition, such as fistula, eversion of the bladder and uterus. In cases of hæmorrhage he found ergot of rye had a very good effect. He did not think ergot of rye had a very good effect in the mare or cow. It certainly had an effect on the bitch, and affected the capillary blood-vessels, becoming a styptic in cases of hæmorrhage. He would recommend a frequent washing of the hands and a washing in

carbolic oil. They should bear downwards to the horns of the uterus, because if one small portion of the decomposing membrane be retained it would to a great extent contribute to the fatal termination of the case. He had known mares—healthy mares, running at grass—retain the fœtal membranes and escape very serious consequences, but in the stable it would always prove fatal; the atmosphere of the stable was much more favourable to decomposition than that of the field, and it would set in more rapidly in the stable. He had known mares go five or six days after the fœtal membranes had been removed and do perfectly well after. (Applause.)

The PRESIDENT said it had been a great treat to hear this paper, but whatever Professor Williams took in hand he brought to bear upon it a fund of robust common-sense that no other man could excel. In this he had acquitted himself of his charge in a wonderful manner, and they would all be thankful that he had come amongst them to discuss this subject.

Mr. FAULKNER said personally he felt amply repaid for having journeyed so far to listen to the comprehensive and lucid manner in which the professor had dealt with the subject. Those gentlemen veterinary surgeons practising in an agricultural district must have been specially interested. His experience in these particular forms of disease was somewhat limited, practising as he did mostly in town practice, but some of the cases mentioned had come under his notice. The first subject was the impervious *os*, and then the Professor went on to speak of the schirrous *os uteri*. They had two cases recently, one of which was in a fine animal in grand condition with about a third calf, and in great distress, making violent efforts to expel the fœtus. This cow had eversion of the vagina and protrusion of the *os uteri*. They had it put into trusses, and with a bar across her back relieved these violent efforts at parturition. He administered a large dose of opium with a hypodermic injection of atropine and morphia. He left the people some large doses of opium, and spoke to them about the Cæsarian operation, and the incision of the *os uteri*, but to neither suggestion would they listen. Everything else was tried, but as it was perfectly clear the cow would die, as she was fresh, they decided to destroy her. He had the uterus for examination, and found that it was as much as he could do to cut it through with a strong scalpel. In another case he incised both sides of the *os uteri*, but the cow died, and on examination the *os* was in a similar condition of thickening. He found that these cows had been served by a bull suffering from Gonorrhea, and to that he attributed the cause. Professor Williams had spoken with regard to the retention of the placenta, and how it was the placenta and the membranes became detached. He thought there were special causes at work; or why was it the degenerative process did not go on unless there was? With regard to parturition in the mare, he agreed with Professor Williams that the sooner the placental membrane was got rid of the better. He remembered one case in which a mare cleansed well, but yet she developed septicæmia, and died, not living twenty-four hours. She did not develop Laminitis, but was boxed in an unsanitary place. In another case a mare was seized with acute rigors. She was said to have cleansed well, but only a portion of the placental membranes had been brought away. The other portion he removed, and the mare went on and did well. In several cases he had seen cows with the placental membrane rotten, and unhealthy action had been set up, but they had got all right; and in others the cows had cleansed all right, and even then septic poisoning had been set up. When it got to the fifth day in a cow, efforts ought to be made to remove them. In the case of rigors he administered diffusible stimulants with opium, and he noticed in the cow a suppressed sort of moan. He came to the conclusion that internal mischief was going on, and alternately with diffusible stimulants and opiates he administered chlorate of potash as a febrifuge.

He also generally gave nux vomica, and washed the uterus out with a long syringe, not forgetting the carbolised oil, one to twenty. He had used corrosive sublimate, but in one case he used it it had an astringent effect, and he blamed himself subsequently for doing so. As to Metritis and septic Metritis, it did not arise altogether from rapid driving, for a cow stood in a byre, she calved, and they got a case of Metritis. He had seen a case of pure Metritis without septic poisoning, and Metritis with septic poisoning. The clue to the development of the disease was the introduction of septic germs. As to uterine hæmorrhage, he used the recognised styptics.

Capt. RUSSELL said he had listened with very great pleasure to the remarks by Professor Williams, and they, as members of this Society, were extremely obliged to him for coming down to address them. He had taken up a subject of great importance, of which they had a number of cases in country practice. With regard to the impervious condition of the *os uteri*, and with reference to schirrosity, he would ask whether it were not easier to cut through the living tissue rather than the dead? [Prof. WILLIAMS: Yes.] He had been surprised to see the manner in which the operation was performed. He only made a lateral incision and an inferior incision, and he was happy to say, in the case to which he referred, that the cow did well. In one or two days she was all right. He had heard what Professor Williams said about the Cæsarian operation, and he was, he must say, rather alarmed at the enormous quantity of blood, with which the operator and his assistants were deluged. He had noticed in performing the operation two gallons of blood flow from a cow in five minutes. In cases of parturition he used chloral hydrate for stopping pain, and he preferred it to opium or any other agent. He quite agreed as to the immediate cleansing of the mare, and had known cases go wrong after leaving it in for twenty-four hours, and the only question upon which he did not quite agree was the condition of the uterus in the cow after parturition. He had frequently noticed the difficulty in introducing the hand into the uterus after five days or so, but he noticed Prof. Williams said it was in a flaccid condition. [Prof. WILLIAMS: Not in all cases.] He frequently used the perchloride solution at about two per cent. The disease which affected ewes a week or ten days before the lambing period came on, where they were seized with more or less paralysis, losing the use of their legs and other symptoms, what would be suggested as the best method of treatment?

Prof. WILLIAMS: I have no experience.

Capt. RUSSELL: We sometimes have twenty or thirty in a flock. They completely lose the use of their legs, and if they are not speedily got up they will die in twenty-four hours.

Mr. HARDY: I have known cases of forty or fifty in a flock.

Prof. WILLIAMS said there was some fatality in the time. Many sheep farmers in Scotland were of opinion that if they fed sheep during stormy weather, they would not flourish; they would rather lose their sheep than feed them during a storm. They allowed them to starve or live as they pleased, and the mortality was something enormous, and the symptoms something similar to what were described.

Capt. RUSSELL: It is due to the sheep having been fed on turnips through the winter, and not having had sufficient dry food.

Mr. HARDY said in his district he went into a field of twenty or thirty heifers, and if the first slipped her calf, nineteen out of twenty would follow that example. He had removed them directly they commenced, but there was exactly the same effect.

Mr. WYER said if a mare foaled, and there was nobody present, and the rectum was thrust out for nine or ten inches, what should be done? He always returned it as well as he could, and removed the foal, but in all the

cases he knew of, they had always proved fatal, although he had exercised every care.

A discussion arose thereon, but no certain remedy was suggested, and Mr. Wyer repeatedly asserted that there were too many fatal cases resulting.

Mr. MACKINDER said there was one question about performing tracheotomy in cases of severe pains and a schirrous *os uteri*. He once divided the *os* in the mare, and successfully; but the man would use the mare a second time. She fell in foal again, and this time it was absolutely impossible to cut through, and she died from the effects. He agreed that directly tracheotomy was used there were no more throes.

Mr. HARTLEY (Lincoln) said that last year he was called to a mare that had been labouring for two or three days. He examined and found a twist of the neck of the uterus. She thrust down her bowels and got her legs among them, and they had to kill her. He thought corrosive sublimate, one to a thousand, was the best for general use. He had a case of schirrous *os uteri* in a cow which had been labouring for four or five days, and he made two incisions, upwards and outwards, and used *oleum eucalypti*, and the patient made a good recovery. He had a case of rupture of the womb, but the cow died.

Mr. GOOCH said he had one case, and he was trying to manipulate the vagina when the mare rolled over, and he had a free passage into the uterus; and he was pleased to hear Professor Williams say he was in favour of the immediate removal of the placental membranes in the mare. When he first came to Stamford, he was called to a valuable racing mare, the property of a nobleman, that had just come from the Emperor of Germany. The mare had a rough sea voyage, and foaled within a fortnight of her arrival. He was called in, but when he went into the stable, she had been wandering all over the box, and the walls were simply smothered with pus. He took the foal away and the fœtal membranes almost immediately, but the mare died within twenty-four hours. Another veterinary surgeon blamed him for taking away the membranes so soon, and the consequence was he lost the practice of his client.

Professor WILLIAMS: That veterinary surgeon knew nothing about it.

In reply, Professor WILLIAMS said, as to the inversion of the rectum, he should recommend removal by amputation. He replied to various arguments adduced, and said that there was nothing calculated to bring on death by inflammation sooner than administration of purgatives. He had read all about this twist in the uterus, and, so far as he was concerned, he could truly sympathise with those gentlemen who had these cases, for he had never a successful case, though he had seen some cases recorded which looked very well on paper. He thought in cases of this kind it was impossible to remove it, and he was speaking of his own experience when he said it was better at once to perform the operation before their patient became exhausted. (Applause.)

It was resolved that the next meeting should be at Grantham.

The PRESIDENT proposed a hearty vote of thanks to Professor Williams, speaking of his address in highly eulogistic terms. Mr. GOOCH seconded, and Professor WILLIAMS suitably acknowledged the compliment.

PATHOLOGIGAL SOCIETY.

Experimental Tuberculosis and Struma. Experimental Infarction of Liver.

AT the November meeting of the Pathological Society, Mr. F. Eve read a paper on an Experimental Inquiry on the Relation of Strumous Gland Disease to Tuberculosis. The author had inoculated rabbits and guinea-pigs from ten cases of strumous glands taken at hazard. No inoculations were performed in the peritoneum, anterior chamber of the eye, or subcutaneous tissue. All

the guinea-pigs became affected with visceral Tuberculosis, and in four cases the rabbits. In a rabbit, the only one inoculated subcutaneously, a chronic abscess containing tubercle bacilli developed; and a rabbit inoculated from another gland escaped altogether, but this gland had undergone fibrous transformation, and no bacilli could be detected in it. The results of these experiments differed markedly from those of Arloing, who found that while guinea-pigs developed visceral Tuberculosis after inoculation with strumous glands, rabbits remained free both when inoculated in the peritoneum and beneath the skin. Arloing, however, only used glands from one subject. He further found that, after Tuberculosis from strumous glands had passed through two guinea-pigs, it still did not produce visceral Tuberculosis in rabbits. Since the primitive virulence of the micro-organism was not restored by passing it through guinea-pigs (which take Tuberculosis readily), he concluded that if it is not yet proved that Struma and Tuberculosis are the work of a distinct virus, yet that of Struma is, perhaps, sufficiently removed from Tuberculosis to constitute a distinct variety. The author had repeated these last experiments, and found that rabbits inoculated with strumous gland disease passed once through a guinea-pig developed as acute a Tuberculosis as after inoculation with miliary tubercle similarly treated. Specimens were shown for comparison. He could observe no essential difference anatomically between the lesions produced in animals by strumous glands and true tubercle. Tubercle bacilli existed in glands in small numbers, and in abundance in the organs of animals inoculated with glands. After carefully searching two glands and many organs of animals which had been inoculated, he found no evidence that this form of tubercle was the "tuberculose zoogléique" of Malassez and Vignal. The clinically innocent cause of most cases of strumous glands was probably due to the soil in which the organism was implanted, the disease being localised in the glands; perhaps its virulence was slightly attenuated by influences brought to bear in them, but there was nothing to show that, *ab initio*, the virus was a specialised form. The author suggested that the substitution of the term "tuberculous gland disease," "Osteitis," etc., for strumous or scrofulous, would remove confusion and tend to a better appreciation of the nature of the disease.

Dr. C. TURNER asked whether the experiments showed that some strumous glands were not tubercular.

In reply Mr. EVE said that all the cases experimented with proved that the glands were tubercular.

Dr. WOOLDRIDGE showed specimens of Experimental Hæmorrhagic Infarction of the Liver. In human beings such infarctions were of very rare occurrence. The experimental process consisted in injecting a solution of a substance—complex proteid body derived from the thymus and testis—into the jugular vein; the whole vascular system thrombosed in a rabbit, but in a dog complete thrombosis of the portal vein only followed. The animal could also be kept alive for a long time. The liver was filled with hæmorrhagic infarctions if the animal was killed in a few days; but if the animal lived more than a week the clot could not be found. But important structural changes, such as thickening of the capsule and patches of cirrhosis were found. Sometimes a bleb of blood formed underneath the capsule of the liver. Fatty degeneration and infiltration with cirrhosis could be detected. The capillaries were enormously dilated. A peculiar affection of the gall-bladder, in which a thick layer of blood formed round it, was described. A colourless tenacious mucus also formed in it and extended into the common duct. This might be a mode of origin of jaundice. Cohnheim and Litten had failed to cause infarctions. In his own specimens there was no thrombosis in the hepatic arteries. The process was neither a simple, inert, nor infective one. The chemical changes in the blood induced a slow clotting.

He suggested that many chronic inflammations begin as diseases of the blood, and might not be characterised by progressive changes, but that, once started, their progress might be made by a series of catastrophes which might be arrested at any stage.

Dr. NORMAN MOORE thought that in cirrhosis due to biliary obstruction the idea last mentioned would not hold good. On examination of Dr. Wooldridge's specimen, he had failed to see one characteristic of infarct as ordinarily understood. At St. Bartholomew's Hospital there had never been seen a case of hæmorrhagic infarction of the liver. The embolus and the well-outlined boundary were wanting in the specimens shown, and their absence prevented the acceptance of Dr. Wooldridge's specimens as true infarctions.

Dr. COUPLAND did not agree with Dr. N. Moore, and thought that the specimens might justly be called hæmorrhagic infarctions. He hoped for great results from this research.

In reply, Dr. WOOLDRIDGE said that he did not know by what other name to call the result as seen in the specimens handed round.

MEDICAL SOCIETY OF LONDON.

Cerebellar Ataxy in a Kitten.

AT a recent meeting of this Society, Dr. HERRINGHAM showed a kitten, aged about four months, one of a litter of four, all of whom were affected with a peculiar paralysis. When equilibrium was maintained, the movements of each limb and of the head and neck were normal; but when attempts were made to walk or run, the body swayed over and the cat lost its balance and fell. The diagnosis was failure of development of the cerebellum, based upon a similar case described by Rumpf (*Archiv Psych.*, xvi., 435), and corroborated by *post-mortem* examination of one of the litter.

Dr. ANDREWS said that under the microscope he found the granular layer of the cerebellum almost absent, and the layer of cortical cells very poorly developed. The spinal cord was normal.

THE WESTERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

THE eighth meeting of the above Association was held at the New London Hotel, Exeter, on September 22nd., T. Olver, Esq., the President, in the chair. There were also present:—Vice-president J. A. Collings; J. P. Heath, Exeter; C. Parsons, Launceston; H. W. Thomas, Plymouth; Professor Pemberthy, London; Messrs. T. Airey, Crediton; H. P. Chase, Tiverton; S. Burton, Torquay; W. H. Bloye, Plymouth; F. T. Harvey, St. Columb; A. H. Oliver, Devonport; R. E. L. Penhale, Hatherleigh; W. Roach, Exeter; J. H. Penhale, Bideford; A. J. Down, Sampford Peverell; W. Penhale, Holsworthy; and the Secretary.

Letters and telegrams, regretting inability to attend the meeting, were received from Messrs. S. Pallin, C. Hoadley, E. R. Smythe, and G. H. Elder.

Messrs. A. C. Stewart, of Cardiff; J. T. Vicary, Launceston; and A. H. Oliver, Plymouth, were unanimously elected members of the Association.

The PRESIDENT then called on Professor Pemberthy to read his paper on "Preventive Inoculation for Black Quarter in Cattle."

The paper was a statement of the result of some experiments relative to Black Quarter (Symptomatic Charbon), a fatal disease affecting cattle. This disease, he said, had been proved to be a communicable one from one animal to another. In some parts of England, the destruction from the disease was

7 to 10 per cent., and the natural loss was most considerable. It was due to a micro-organism, which was in character very much similar to that which produced Anthrax, a disease fatal to the human subject, as well as to the animal. The bacillus, which lived without oxygen, could be destroyed by no kind of fermentation. Experiments had been carried out relative to this disease by eminent French scientists, whose method was to inject the dried virus. The result, however, of his own experiments established, he thought, that it was much better to inject the virus in the liquid form. This he obtained from an animal which had died of Black Quarter. Before putrefaction set in, a portion of the muscular tissue was chopped away very finely, and sqeezed through a jelly-bag or piece of coarse linen. The product of this was mixed with four or five times its quantity of water by weight, and when strained a clear fluid remained. This was the virus used in the inoculation, and from fifteen to twenty-five drops were injected into the jugular vein by an ordinary hypodermic syringe. Especial care had to be taken to prevent the virus coming into contact with the connective tissues, or the result would be very quickly fatal. With this precaution, however, the operation was extremely simple. He quoted cases in which the inoculation had conferred absolute immunity. There was an instance where he inoculated fifty-six animals near Manchester, in which he was unfortunate. Two of the fifty-six died, and that was owing to the bungling of the attendant, who was somewhat nervous while forcing up the vein, causing the virus to come into contact with the connective tissue. He disapproved of setoning. Many of the animals suffering from the disease upon which he experimented had been restored, and he did not believe that the insertion of setons had any protective effect against Black Quarter. His paper was not one of inferences, but of facts, and these bald facts he placed before them that they might draw their own inferences.

An interesting discussion followed the reading of the Professor's paper, in which nearly all those present took part. There appeared to be a general consentaneity of opinion that setoning did in some way afford a certain amount of protection against Black Quarter, although it was difficult to explain by what action. It was agreed that if we had more knowledge of the method and channels whereby the bacillus gained ingress to the bodies of its victims, we should be in a better position to adopt preventive measures. The disease appeared to be most rife during the antumnal rains of October and November. It was regarded as a fallacy to suppose that the best of the herd were those most usually affected, or that high feeding rendered an animal susceptible to the disease. The results obtained by the Professor were distinctly progressive, and so far satisfactory; and it was hoped he would continue with his experiments, so as to render the operation of protective inoculation simple, easy, and safe.

Mr. COLLINGS proposed, and Mr, J. H. PENHALE seconded, a most hearty vote of thanks to Professor Pemberthy for coming there among them and giving them so much interesting matter to think over.

On the proposal of Mr. HEATH, the Professor was unanimously elected an Honorary Associate of the Western Counties Veterinary Medical Association.

It was resolved to hold the next meeting at Exeter, in March.

A vote of thanks was accorded the President for his able and court eou conduct in the chair.

After the meeting the President entertained the menbers to an excellent dinner, after which the usual patriotic and professional toasts were indulged in and duly responded to, and a most enjoyable evening spent. So closed one of the most successful meetings which the Association has yet held.

W. PENHALE, *Hon. Sec.*

GLASGOW VETERINARY COLLEGE.

THE winter session of this College commenced on Wednesday, 5th October, when a large attendance of members of the profession, students, and visitors, was present.

The introductory address was delivered by Principal McCall. After making a few cursory remarks on the alterations that had taken place in the teaching staff, and the changes which were proposed should be made in the curriculum, the Principal complimented the retiring Board of Examiners for the courtesy they had shown during their term of office, and then passed on to the consideration of the subject of his address, viz.:—

PLEURO-PNEUMONIA IN CATTLE.

He said: This disease for the past thirty years has engaged a large share of my time and thought, and in all the introductory lectures I have had the honour of delivering here I have regularly referred to it, and the present, for various reasons, shall be no exception. As my remarks at this time are principally directed to students and laymen, I may say that when I entered the ranks of the profession, and for years after, few veterinarians in this country entertained the opinion that Pleuro-pneumonia was a contagious malady, and for that reason it was widespread. In 1859, when I commenced practice in this city, Pleuro was present, I might almost say, in every cow-shed, and it was the same in Edinburgh and all large towns in the three kingdoms. It had spread also to the country districts, and in the lines of cattle traffic its victims could be told by hundreds. In the then celebrated Hundred Acre Hill, with its 900 dairy cows, Pleuro always existed, and so certain were the animals to take the disease, that new purchases were placed at once alongside affected animals. The pecuniary loss by this disease to stock proprietors was immense, the computed annual loss in this city alone being £4,556; but agriculture in many of its branches being prosperous, it was quietly tolerated, and looked upon as an inevitable consequence of keeping live stock—in fact, a loss that must be borne, and the less said about it the better. That undoubtedly was the view taken by agriculturists, and had it not been that the country was visited by a more rapid and deadly scourge than Pleuro-pneumonia, viz., Rinderpest (Russian Cattle Plague), it is highly probable that such is the view which would have been entertained until this day. In 1865 Cattle Plague was imported, and this malady spreading with lightning rapidity, and almost annihilating the cattle of some districts within a few days, it roused the country, and finally the Government, into action. No machinery was, or ever had been, in existence to deal with disease in the lower animals. All attempts hitherto to get the Government to interfere in the spread of cattle maladies had signally failed, and no doubt on this occasion would also have failed had it not been that the Government were confronted with a malady which, if left alone, would ere long exterminate the breed of cattle in the country. A Veterinary Department was created, recommendations were issued, and Local Authorities constituted. Medical treatment was recommended and adopted. Sanitariums were built, but steadily the disease moved on, and wherever it entered total extinction of the herd was the result. In this city, within a fortnight of the first appearance of the malady, many byres had been cleared of their whole occupants, and the dairymen, in not a few instances, left almost penniless. To save life, I need scarcely say, is the earnest desire of all who practise the profession of medicine, and many and varied were the medicines administered, and the measures adopted to wrest the poor dumb creatures from the grasp of death, but all to no purpose. The advice now tendered to the Government was to slaughter all herds the moment the first victim had fallen a prey to the affection, and to compensate the proprietor out of the Imperial funds. A perusal of the college scrap-book at this date is

interesting and sometimes amusing as regards the language used in expressing the writers' horror and contempt for the advice so given. The Government, finding all efforts fruitless in extinguishing the disease, finally issued an Order to slaughter and compensate, and from the day that Order was put in force the disease gradually ceased to spread, and in a very short time was stamped out. Complete success having attended the Government measures in ridding the country of Cattle Plague, pressure was now brought to bear on the Government to deal in a similar manner with Pleuro-pneumonia, and to which it reluctantly responded. The first step taken by the Government was to declare the movement of an animal affected with Pleuro punishable. The second was to make the place where the affected animal was found an infected place. The third was to make it compulsory to slaughter affected animals, to isolate and there detain the remainder of the herd so many days. By-and-bye came the Order of compensation, with slaughter, one-half the value of the animal being allowed, and the period of detention of suspected animals increased. It must be allowed that by these measures the number of outbreaks were curtailed, but the disease was far from being wiped out. An order was again passed increasing the compensation to two-thirds the value of the animal slaughtered, and increasing the days of detention of the remainder of the herd. Power has also lately been given to Local Authorities to slaughter whole herds and grant compensation, to regulate the movement of cattle within their jurisdiction, to close markets, and to declare a whole burgh or county an "infected area." In fact, it might be asked what is it that a Local Authority cannot do with the view of preventing the spread of Pleuro-pneumonia? And, notwithstanding the enormous amount of money spent in carrying out these measures, Pleuro-pneumonia is, I think, at the present time more prevalent than it has been for the last twelve years. To all appearance we are making but little progress in our endeavours to stamp out the disease. True, in some towns and districts the malady has almost been banished, but, I repeat, speaking of Scotland as a whole, the Orders in Council have failed in dealing with this disease. Now, are we driven to the conclusion that Pleuro-pneumonia is a disease which cannot be controlled by such remedial measures as the Government have placed in the hands of the authorities? Many persons say so, but I cannot concede that. The power which the Government have deputed to be exercised by the Local Authorities is ample, but it is misplaced, and always has been misplaced. It is exercised judiciously and with the best results by some Local Authorities; and it is exercised injudiciously, frequently oppressively, by other Local Authorities, and with questionable results; and by not a few it is all but a dead letter. The Government measures in the hands of the Local Authorities, and read by their results, have been a signal failure in so far as stamping out Pleuro is concerned. And what about their effects on trade? Speaking for this city, I am in a position to prove that the action of certain Local Authorities during the past eight months or so has diverted from this city dues connected with its cattle trades amounting to a sum not less than £5,000 sterling. And what about the pecuniary losses sustained by private traders? I could mention the names of many traders, graziers, and farmers who, by the action of the Local Authority of Lanarkshire in declaring their county to be infected, have been prevented this whole season from sending cattle to their grass fields. Many of the persons I have in remembrance, who leased grass fields for the season at high rents, and even paid the rent in advance, have been prevented from placing a hoof on them, and why? Because there were, or had been, a few outbreaks of Pleuro, probably six miles off this week, and the next week probably thirty-six miles. Regarding infected areas I am strongly of opinion that under no circumstances is it expedient or necessary to declare a whole county or burgh an infected area in dealing with Pleuro-pneumonia. Nay, I would say that it

must be under exceptional circumstances that the "infected area" requires to be extended even to the radius of one mile. Pleuro-pneumonia is only spread by cohabitation, and if the affected animals be immediately slaughtered (as the Act expressly stipulates), and the remainder of the herd kept within the walls of the "infected place," there is no more danger to be apprehended from animals passing the premises, if need be, than individuals passing round the outside of a fever hospital. If the suspected herd be at grass, rail off a space of a few hundred yards; do not permit the suspected herd and sound herds around the boundary to approach each other; and the cattle are as safe in their relative positions as if miles intervened. If I am correct in my belief—and I think I have had sufficient practical experience to settle this point—what nonsense, what injustice it is to stock proprietors to declare a whole county an "infected area"! In support of my opinion—an opinion I have held for at least twenty years—Pleuro-pneumonia is only spread by cohabitation, I shall read you the following letter, of date 2nd September, 1887, and addressed to me by Mr. Gadsden, Philadelphia:—

"Philadelphia, September 2nd, 1887.

"Professor James M'Call, F.R.C.V.S.

"My dear Sir,—About the commencement of the present year I wrote you of an experiment that was to be tried in Chicago, Illinois, of placing healthy cattle in the sheds of the Shufeldt Distillery, which had previously contained animals affected with 'contagious Pleuro-pneumonia.' I gave Mr. Shufeldt an opinion at the time that I considered this perfectly safe, and that contagion could only be conveyed by contact with the living diseased animal. He now writes me that the experiment has been successful; that the 900 steers placed in the sheds on the 18th of December, 1886, were slaughtered (fat) in June and July, 1887, under State veterinary supervision, all the lungs carefully examined, and not a taint of the disease found in any of them. It is true that these sheds were superficially disinfected, but the flooring was not removed, nor the refuse under the floors taken away. As to the virulence of the disease shortly before this test was made there can be no doubt, and the rapidity with which it spread among living animals my *post-mortem* (of steers in Chicago) showed that of some of the herds destroyed eighty per cent. of the whole number were affected. I am deeply interested in the extermination of this scourge in the United States, and I would very much like to have your opinion as to the reason that Pleuro-pneumonia prevails to such an alarming extent to-day in Great Britain, notwithstanding the stringent laws that you have, and the vigorous efforts made to eradicate it. I am firmly of the belief that the chronic and so-called recovered cases in the country have been the centres of contagion that have communicated the disease to the West, and caused the frequent outbreaks in localities where it had not heretofore existed; and I would like to know if you experience the same results in England and Scotland. The reports in the *Veterinarian* show that the disease prevails to a greater extent in Scotland than in other parts of the kingdom; and knowing that inoculation has been extensively tried in that country, I would like to have your opinion as to its value in preventing the spread of this disease, or whether it has not rather tended to keep it alive and introduce it where it did not exist.—Trusting you will pardon me for again troubling you on this important subject (to us), I have the honour to be yours, very respectfully,

(Signed) "J. W. GADSDEN."

In dealing with such a disease as "Foot-and-mouth," it may be a wise step to declare a whole county, or even a kingdom, an "infected area," but as regards Pleuro-pneumonia it never can be so, and no Local Authority should be permitted to exercise such a power. But to return, the Government measures exercised by the Local Authorities have not only failed in

stamping out Pleuro-pneumonia, but in even keeping the malady in check, and the all-important question arises what should now be done? Two methods may be pursued. The first, and probably the best, devolves the whole or greater part of the duties on the Privy Council, and abolishes or curtails the power of Local Authorities. The second desires the Privy Council to appoint a central board to control and regulate the action of the various Local Authorities, and make the slaughter of whole herds, with compensation, compulsory on every Local Authority wherever the disease makes its appearance. By adopting either of these methods and energetically following up outbreaks as they occur, Pleuro-pneumonia, like Rinderpest, would be banished from these shores, and the vexatious restrictions under which the live cattle trade is, and has for years been, conducted, done away with. As I have stated elsewhere, inoculation is a valuable and yet a dangerous remedial measure to apply to this disease, or to allow individuals to exercise it as they may feel inclined. I am surprised at the ignorance and prejudice displayed by many persons—professional and non-professional—regarding the effects of inoculation. We have, on the one hand, a large body of professional and non-professional men who have no faith in inoculation, and do not believe that the lymph of the lung has a specific action when inoculated, and we have, on the other hand, a considerable body of professional and non-professional men who have implicit faith in inoculation under all circumstances. Now, both parties are in error. The first in misbelieving or believing too little, and the second in believing too much. Judging from my own experience, I feel warranted in making the following statements:—1. That a sound animal inoculated with fresh lymph taken from the lung of a Pleuro animal is thereby rendered proof to an attack of Pleuro-pneumonia by cohabitation. 2. That a diseased animal, *i.e.*, an animal labouring under an attack of Pleuro-pneumonia, may, notwithstanding, be successfully inoculated. 3. That the success or non-success of the operation is no proof of the animal being free from or labouring under Pleuro-pneumonia at the time or prior to the time of operation, but a proof of the vitality or non-vitality of the virus used. 4. That a successfully-inoculated animal having sound lungs at the time of inoculation gives off no contagion, and never transmits the disease to other cattle. 5. That a successfully-inoculated animal having diseased lungs at the time of inoculation gives off contagion and transmits the disease to other cattle. 6. That a successfully-inoculated animal having an encysted portion of lung at the time of inoculation gives off no contagion, but when the cyst wall breaks or becomes dissolved it will then give off contagion and spread the disease to other cattle. 7. That no professional man can with certainty affirm that the lungs of an ox are free of encystment, because the cyst may be buried deep in the lung and covered by healthy lung tissue. If the opinions expressed be correct it is self-evident that a herd of cattle inoculated after one or more of their number have succumbed to Pleuro-pneumonia can never with safety be allowed to mix with sound stock. True, they could with safety if none of them at the time of inoculation had contracted the disease by cohabitation or, as we term it, the natural method, but it being a slowly incubative affection, it is scarcely possible for one or two animals to fall victims to Pleuro and the remainder to be sound at the time their neighbours died. I would not accept of an inoculated animal out of a herd where inoculation had been had recourse to after one of the herd had died of Pleuro-pneumonia. But if inoculation had been practised on a perfectly sound stock I would not hesitate to receive the inoculated animals among my own, and, indeed, I have them at the present time under these circumstances, and have had them for the past nine months, and with no ulterior consequences. Cattle inoculated in a stock after Pleuro has made its appearance should be kept by themselves, and, as soon as they are in condition for the butcher,

slaughtered. In Edinburgh, as is well known, inoculation is frequently practised after Pleuro has manifested itself in a dairy, and undoubtedly many lives thereby been prolonged. In due course these inoculated cows, when fit for the butcher, are conveyed to the auction mart or market and there sold. To their destination they proceed, and on their journey spread the infection to healthy stock with which they are allowed to cohabit. The county of Lanark has had a painful and most expensive experience of the truth of what I have said, and I am in the position to prove that without almost an exception the numerous outbreaks of Pleuro which have taken place in that county during the past nine months have been traceable to diseased and inoculated fat dairy cows hailing from the city of Edinburgh, and sold at certain auction sales in the county. In Glasgow, as is well known, the Local Authority deal very rapidly with outbreaks of Pleuro-pneumonia by slaughter and not by inoculation, and the annual loss has been cut down from £4,556 to under £450; and while the disease in the county of Lanark has probably never been as widespread, in Glasgow we have only had three outbreaks during the past twelve months. We are anxious that these facts should be known, as Glasgow is a great receptacle of cattle from all parts of Scotland, Ireland, Canada, and the United States; and I can with confidence assert that the system of inspection adopted and the vigilance exercised by the Local Authority of Glasgow is so complete that cases of Pleuro-pneumonia do not escape detection. In Ireland Pleuro-pneumonia has still a footing, but at present its ravages are confined to the counties of Dublin, Meath, Kildare, Louth, and Wicklow. If a cordon were drawn round these counties, say for six months, and bold and energetic measures had recourse to for the extermination of the malady I do believe it would be stamped out. Being a breeding country, and not requiring to import stock, there is no valid reason for the continuance of the malady except the supineness of the Local Authorities. The stock proprietors of Ireland ought to rise in a body and insist upon these counties being closed and kept closed until Pleuro-pneumonia has been extinguished. The enhanced value of Irish stock shipped to England and Scotland, and the impetus that would be given to trade by the removal of all restrictions, would in a short space of time compensate all parties for present loss and inconvenience. Then what an honour it would be to the Irish nation to demonstrate to the world that Pleuro-pneumonia like Rinderpest is not indigenous to their country, and can be "stamped out."

The CHAIRMAN (Dr. MCVAIL) said:—

GENTLEMEN,—The duty that falls to me now is a very pleasing one—that of asking you to thank the Principal for the very admirable address which he has just given us. The importance of the conclusions to which the Principal has come in connection with Pleuro, particularly with regard to inoculation and its protective power in that disease, are of very far-reaching consequence. These conclusions not only affect that disease, and so affect to a large extent the food of the people, but unquestionably they throw light on the whole subject of the contagious diseases not only of the lower animals, but of the human race itself. And, as belonging to the profession of medicine which has to do with treating humanity, I should like very much to see in connection with the great Fevers, the influence of such inoculation experiments as Professor McCall has arrived at, fully applied. It really seems as if the profession of human medicine, in so far as infectious diseases are concerned, were going to lean in the future considerably on the results arrived at by veterinarians. The two professions have been becoming more closely linked in recent years, and I should like to see much more intercourse between the two sections. It is in one sense to veterinary medicine, the profession of human medicine owes by far its most important result, viz., vaccination. For the initial steps of that great discovery by Jenner were owing—not to his

knowledge of ordinary medicine, but to his knowledge carefully, laboriously, very thoroughly acquired of the eruptive diseases of cattle.

Now, if any physician were asked which group of all the diseases that affect humanity he found most difficult to treat, he would unquestionably say the tubercular group of diseases. In this group there can be no doubt we will get help from your section of the profession, for recent observations have shown that the tubercular diseases of cattle are inoculable—that tubercular animals slaughtered and eaten by other animals may cause in these Tuberculosis to be developed. Now, if that be so, the question comes, Does the consumption of such food by man give rise in the human race to Tuberculosis? Does it give rise to Tuberculosis in individuals predisposed by weakness or some peculiarity of certain organs to the reception of the tubercle bacillus? That is a question of immense importance, and the solution of that question is quite as much in your hands as in the hands of physicians. Further, does the milk of tubercular animals communicate Tuberculosis? The answer to that has been in the affirmative. Not only so, but it seems to communicate Tuberculosis if the milk gland of the affected animals be free from any actual tubercular disease. That has been demonstrated by recent experiment. Really, we must have closer communication in the scientific work of the two professions. Then, again, there is that other most important discovery made last year by Mr. Power, regarding an outbreak of Scarlet Fever that was traced to cows at Hendon. There are also the observations of Professor Klein in connection with a similar case at Wimbledon, in which it was shown that the poison which gave rise to Scarlet Fever in the human subject was produced in the cow, the disease, while in the cow itself, being of a comparatively light and non-fatal nature. The question then comes, Is it within the cow the poison is developed? and we must look to your profession again for help. Therefore, there is ample work for those gentlemen who have got these medals to-day. In my own profession there has been an almost entire change since the days of Bob Sawyer, and your side of the profession has relatively been advancing with more rapidity in the way of improving scientific measures. There can be no doubt at all that the next twenty years will see a great change in our ideas of infective disease; but unless we have help from veterinary medicine, it is quite impossible to solve such questions as I have indicated. Gentlemen like those who have got these medals, should work up the whole subject of Bacteriology, and you have much more opportunity of tracing to their final issues these minute organisms in the animal, than we have in the human subject. *Post-mortem* examinations are beset with great difficulties in the human subject—not so with yours; and for the other section of medicine that has to do with humanity, you can do a great deal for them that they themselves cannot do.

In this College I know you will get every advantage of working up to the highest stage of your profession. Professor McCall has referred very modestly to the methods of dealing with the infectious diseases in Glasgow, but Professor McCall might have said that the methods were largely of his own planning.

With such professors as you have, and ample laboratory accommodation; with Professor Limont, who will do everything he can to aid you in such studies as I have mentioned, you should use your advantageous circumstances to the very utmost, for when you leave such a school as the present, and go into practice, you will find it very difficult to acquire the methods of scientific research. Acquire such knowledge now, and I have no doubt the students of this session will add fresh lustre to the College.

I have much pleasure in proposing a vote of thanks to Professor McCall.

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting of the above Association was held at the Blackfriars Hotel, Manchester, on Sept. 2nd, 1887.

Present.—Prof. Williams, Prof. Lewis, Edinburgh; Messrs. T. Greaves, Peter Taylor, W. A. Taylor, S. Locke, J. B. Wolstenholme, T. Hopkins, J. Ingram, F. D. Garside, W. Dacre, A. J. Jones, H. D. Chorlton, T. Horrocks, Manchester; Jos. Abson, Sheffield; A. Munro, Altrincham; H. Ferguson, Warrington; J. G. Mayor, Kirkham; E. Kitchin, and the Secretary, Liverpool; A. M. Michaelis, Stockport; G. Ellison, Chorley; R. H. McRaith, Lancaster; Jos. Faulkner, Rochdale; W. H. Bridge, Bolton; F. Carter (student), W. Hall, Royton.

In the absence of the President, Mr. Thos. Briggs, who had unfortunately met with an accident, the vice-president, Mr. J. B. Wolstenholme, was voted to the chair.

Apologies for non-attendance were received from Professor Walley, Hy. Thompson, J. E. Eltoft, J. S. Hurndall, J. Marshall, T. Leather, W. W. Smart, W. F. Greenhalgh, J. H. Carter, and the President, Mr. Thos. Briggs.

Mr. S. LOCKE proposed, seconded by Mr. W. A. TAYLOR, that Mr. R. H. McRaith, M.R.C.V.S., of Lancaster, be elected a member of the Association. Carried unanimously.

Prof. WILLIAMS then introduced, by a short lecture, the subject of Therapeutics. He reviewed and dwelt at some length on the practice of exhibiting physic in cases of injuries to the foot (Punctures, etc.), Pneumonia, and in cases of intestinal obstruction accompanied by inflammatory symptoms, etc. He held that the giving of a rational dose of physic in the first class of cases was beneficial, but condemned it in Pneumonia and in cases of intestinal obstruction alluded to. He spoke very favourably of his experience with cocaine and of strophanthus, the new cardiac tonic, the latter being superior to digitalis.

The result a very valuable and interesting discussion, taken up by the majority of those present, including Messrs. Thos. Greaves, P. Taylor, W. A. Taylor, W. Dacre, S. Hopkins, Prof. Lewis, J. G. Mayor, S. Locke, and the Secretary.

Proposed by Mr. THOS. GREAVES, seconded by Mr. S. LOCKE, that a very hearty vote of thanks be accorded to Prof. Williams, which was carried by acclamation.

The usual vote of thanks to the President terminated the meeting.

ARTHUR LEATHER, *Hon. Sec.*

ROYAL AGRICULTURAL SOCIETY.

AT the monthly meeting, held on November 2nd, Sir John Thorold stated that the following report had been received from Professor Brown:—

Pleuro-pneumonia.

This disease increased to some extent in England during July and the beginning of August, but during September and the first three weeks of October decreased again to nearly its average rate of prevalence.

In Scotland the disease was much more prevalent than in England during the first six months of the year, but began to decrease in July, and for the past few weeks the number of outbreaks has been less than in England, the last published return showing only two outbreaks in Scotland in a week. Swine Fever has decreased during the past two months, the outbreaks being now about 100 per week, as compared with nearly double that number in June and July.

Anthrax.

Anthrax still continues to maintain about the same rate of prevalence as it has done during the past six months.

Eruptive Disease of Cows.

The inquiry into the nature of the eruptive disease of the teats of cows known as the Hendon Cow Disease is now being actively carried on, and some important evidence has been obtained. But up to to the present time none of the cases of disease in cows have proved to be in any way associated with Scarlatina in the districts in which the milk was distributed.

The Committee regretted that further investigations in regard to the protective value of inoculation for Quarter Ill and other contagious diseases cannot be carried out except by operators individually licensed, and that in consequence of a misunderstanding as to the state of the law on this point, Professor Robertson is at present unable to continue his inquiries.

Colonel KINGSCOTE commented upon the action which had been taken by the anti-vivisectionists in moving the Home Office to interfere with Professor Robertson's investigations, and suggested that perhaps Professor Brown could give them some information on the subject.

Professor BROWN said that there were two points in the case which he wished to make clear—one as to the employment by the licensee of an unlicensed assistant, and the other as to experiments in inoculation. A general impression prevailed that a man holding a license was at liberty to employ an assistant; but in a letter which he had received from the Home Office, in reply to his inquiries, it was stated that such a course was decidedly illegal, and was also undesirable. Moreover, not only must the experiments be performed by a person holding a license, but they must be carried out in the place registered for the purpose. As to the performance of experiments for inoculation, he had obtained from the authorities an opinion that inoculation performed for the purpose of protecting animals from disease would not come within the meaning of the Act, but experiments for the purpose of finding out whether inoculation would benefit animals would do so. He therefore came to the conclusion that it would be necessary to discontinue the inquiry in regard to Swine Fever.

Mr. JAMES HOWARD thought that the arrangements respecting the contagious diseases of animals were in a very unsatisfactory condition. The stock-owners of England did not know which body to look to for instruction and guidance. A central authority was required for this purpose, and he (Mr. Howard) recommended to the attention of the Veterinary Committee the desirability of coming to some understanding with the Agricultural Department of the Privy Council on the subject.

Sir JOHN THOROLD gave notice that at the next meeting of Council the Committee would move for their annual grant of £500, of which sum they recommended that £200 be granted to the Royal Veterinary College in aid of the further development of cattle pathology. With regard to the grant of £200, a letter had been received from the Principal, Professor Robertson, explaining that since the Council had acceded to the application of the Governors for an annual grant, means had been taken to extend and perfect the course of instruction given at the College with regard to cattle pathology. So far as carried out at the present time, these include:—

1. The delivery of one extra lecture each week on the subject of diseases affecting other animals of the farm than the horse.

2. Providing means for the purchase of specimens, morbid and healthy, to illustrate these lectures.

3. Maintaining at the College a stated number of cows in calf, so that the students may have the opportunity of becoming practically acquainted with

the management of parturition, and of the diseases affecting cows at this critical period of their life.

4. Furnishing a bed-room, where students may, when deemed needful, be lodged over-night when attending these cases of parturition.

Other means of extending and improving the instruction in all matters relating to disease affecting this particular class of farm-stock will be adopted as the governing body believe to be advantageous, and the means at the disposal of the College will permit.

BORDER COUNTIES VETERINARY MEDICAL SOCIETY.

A GENERAL meeting of the above society was held at the Bush Hotel, Carlisle, on the 14th of October. *Present:*—A. J. MacIntosh, Esq. (President), in the chair; Professor Williams, Edinburgh; Messrs. Soulsby, Workington; Carlisle, Bell, sen., Bell, jun., Dawson, McCauley, Carlisle; Donald, Wigton; Thompson (treasurer), Aspatria; Howe, Keswick; Crondace, Haltwhistle; Chalmers, Longtown; Young, Cockermouth; Robson, Armstrong (sec.), Penrith. *Visitors:*—Messrs. F. Armstrong, Penrith; Ashley and Anderson, Wigton. Apologies were received from Professors Walley and Lewis, and Messrs. McConnell, Castle Douglas; Harrison, Burtergill; Pears, Langholm; Carruthers, Brampton; Hoadley, Eston.

The Secretary then read the minutes of the previous meeting, and they were adopted.

The following gentlemen were nominated to be elected members at the next general meeting:—Messrs. Trongbear, High Hesket; F. Armstrong, Penrith; Chalmers, Annan; Bell, Haltwhistle; Anderson, Hexham.

The election of office-bearers for the coming year was next proceeded with. Mr. Bell, Carlisle, was elected President. The following gentlemen were elected Vice-Presidents:—Messrs. Potts, Wigton; Young, Cockermouth; Soulsby, Workington; Crondace, Haltwhistle. The treasurer (Mr. Thompson) was re-elected; also Mr. J. Armstrong, the secretary.

Rule IV. of the Society's Rules was then considered, and it was decided to print the rule on the circulars convening the next meeting, and after that to enforce the rule.

Mr. J. SOULSBY, of Workington, then read a very able and well-compiled paper as follows:—

Mr. President and Gentlemen,—It would be absurd on my part, should I, in presenting this paper to you, claim any great excellence for it or myself. It is the characteristic of this age, that nothing can be done without receiving aid from science; and scientific men in furthering their objects can learn much from comparing notes, and from the free discussion of such special or peculiar cases as may from time to time come under their notice, and these, communicated and commented upon, for the general benefit of all. No science is more noble or more interesting than that of medicine; and we claim for our profession, as veterinary surgeons, notwithstanding the great drawbacks under which we labour, in having to deal with dumb creatures, that it is as far advanced at the present day as the sister profession or that of human practice. We have like them much to learn, and it should afford us all great pleasure in giving up for our mutual benefit any new experience or other matter of interest which may come under our notice in our daily practice.

I have been asked to read a paper, and have chosen for its subject, "Tetanus," a disease most interesting to our profession, and the few notes—I cannot call them more—I have collected together, will have to do duty for my paper. The reason I consented to read a paper, and selected this subject, gentlemen, was on account of my having a very singular case in my hands at the time, singular, as it arose from a peculiar cause. I should also like to

submit to your notice a case of "Open Joint" I had under my care a few months ago, more with regard to the treatment I adopted, which surprised me at its success.

Tetanus, or Lock-jaw, is the name given to that disease of the nervous system, where we get tonic or continued spasm of most of the voluntary muscles of the body, which spasm is not under the control of the animal.

There are many different theories as to the nature of this disease, but the one generally accepted is that, in Traumatic Tetanus, or that variety which is brought about by the infliction of injuries, the extremities of the afferent nerves of the wound or wounds are irritated to such an extent, either by dirt, noxious gases, dressing with too strong lotions, or the two edges of the wound, during the healing process, closing on the entremities of the nerves; which irritation is conveyed to the different nerve centres, and causes an exalted polarity of those centres. This theory is strengthened by *post-mortem* examinations, when we nearly always find along the course of the nerves supplying the wounded structures, congested patches and thickening of the nerve. But it is a very difficult matter to form a correct opinion as to the nature of this disease. From my own observations of the cases I have been called to, I think there must be some peculiar susceptibility in the animal affected; it may be an unhealthy condition of the body. We must all have noticed that the disease is most often met with in animals that are improperly fed and housed in badly ventilated and overcrowded stables, and neglected generally. I do not say that Tetanus will not affect an animal that is in every way carefully attended to, but we find the majority of cases the other way. On the other hand, if we take a certain number of animals that are stabled, fed, and looked after exactly alike, and having wounds on them essentially similar in extent—for instance, in castration or docking—we may find one or two perhaps affected with Tetanus, and very likely those that are affected are animals we never for a moment thought would take the disease. At one time I always made it a rule, when called to a case of wound in the horse, to inquire if the patient was nervous or irritable, as I was under the impression that that class of animal was more liable than that of a sluggish temperament; but I have found quite as many cases in one as the other. These facts point out, I think, that there certainly must be some peculiar condition of the body at the time the wounds are received, when Tetanus supervenes; but what that condition is it is impossible to say. There is also, I think, much to be said with reference to atmospheric conditions, and the climate of the locality or district; as instances, I noticed, in a very extensive practice where I was an assistant, viz., at Stevenage, in Herts, only one case. At Worcester, where I was also an assistant, the percentage was certainly greater, and I was exactly eighteen months at each place, but not anything like what it is either at Workington or Whitehaven, and I may add that likely cases for Tetanus were quite as common in one place as in the other.

All the animals we are called to are liable to be the subjects of this disease, but we mostly see it in the horse, now and again in sheep, but very rarely in cattle; and is spoken of as Traumatic, following wounds of all kinds, bruises, etc., and Idiopathic, that which arises from no appreciable cause; but I think, from the inquiries I have made from different veterinary surgeons, and my own observations, nearly all the cases we are called upon to treat are due to wounds of one kind or another, except in cases brought about by exposure to cold and fatigue.

The exciting causes of Tetanus are wounds, bruises, fractures of bone, and operations, such as docking and castration; and in our patients it is generally some time after the infliction of the wound that the disease manifests itself. I remember one case I was attending where the disease did not show itself until between three and four weeks after the wound was

received; in fact, I had discontinued my visits, as the wound was nearly healed.

We generally find Tetanus following wounds on prominent surfaces of the body. I mean by prominent, those parts that are liable to continued irritation, as the knee or any joint of the legs, the back—as in saddle galls, where the saddle irritates; or when the wound on the tail, after docking, is irritated by friction against the front of the cart, or rubbing against the stall in the stable.

The extent of wounded surface has really nothing to do with the liability of an animal to become affected, as we often see it following wounds that are very slight. We very often get it in castration and docking. I think the majority of cases following castration occur when the operation has been performed by caustic clams; I come to this conclusion from the fact that nearly all the cases I have heard of—I never had one myself—have followed after operating with the clams.

Tetanus very often follows pricks in the feet, and, as in the case to which I wish to draw your attention, Chronic Laminitis, together with the shoe pressing on the sole. I never heard of Laminitis causing Tetanus before, and I was very much surprised that such was the case; I could not be mistaken that this case was due to Laminitis, as there was no other apparent cause whatever. My treatment of this case I will give in due time.

Another cause of this disease is exposure to cold and wet, especially after clipping and fatigue. I remember, a few years ago, being called to a mare that had been embedded in a bog. It was a raw, wet, cold day. She had struggled for a number of hours. I saw her a short time after she had been extricated, and found her terribly exhausted and suffering from acute Tetanus, from which she died the same day. I have heard of cases similar to this in sheep, after shearing, when the animals have been turned out, the weather being wet and cold.

The symptoms of this disease cannot very easily be mistaken. There are several forms of it, viz.:—When we get the facial and masticatory muscles affected it is spoken of as Trismus; Opisthonotos is the term used when the muscles of the back and neck are involved; Emprosthotonos is the condition directly opposed to the latter; when the muscles of the side are affected it is spoken of Pleurosthotonos. But in the horse we always find the different forms existent at the same time. If we are called in at the commencement of an attack, we find the animal with his nose elevated and protruded, and the nostrils dilated, with a very anxious expression; and, if eating, he chews his food with difficulty and swallows with a decided jerk, as if he had a sore throat; and, if the fingers are inserted into the side of his mouth, a quantity of saliva will drop out; sometimes the saliva gathers round the angles of the mouth.

The throat externally looks to be quite swollen, and when we feel it we find it quite tense and hard. I have known cases where this symptom has led the owner to think the animal was suffering from Strangles. In fact, the last case I had the owner of the horse said I had to take a lance with me, as I would find the throat would require lancing. When I saw the patient it was a decided case of Tetanus, and the animal had been affected four or five days.

We also find the tail elevated, and very often it has a continuous trembling motion. The limbs are set wide apart, and when the patient moves he scrambles along rather than walks, and bends his limbs with great difficulty. The muscles of the back and loins are quite rigid and feel very hard. The patient being approached quietly, the pulse will be found not very much altered in number, but in character it will feel hard under the finger.

The temperature is certainly raised, but not to any great extent—not more

than 103° F., unless the case is one of a very acute character. In severe cases we often get very profuse sweating; I have seen cases where the animal appeared as if buckets of warm water had been thrown over it, and the box has been filled with steam. In many cases we do not get the jaws completely locked; in fact, the animal may be able to eat hay or grass and drink water, the desire to do so is constantly present. The bowels are, as a rule, constipated. All these symptoms may become intensified by many circumstances, such as making noises, too suddenly approaching the patient, sudden flashes of light, and even loud talking; and I have seen a case when the mere touching of the slings supporting the animal has caused it to scream out with agony.

During the course of the disease we get periods of increased spasm; and if the animal is getting worse, these periods keep recurring with such frequency that the poor beast at last falls down from sheer exhaustion, and dies either from inability of the diaphragm to act properly, or it may be from spasm of the muscular fibres of the heart.

We may generally form a pretty correct opinion as to the termination of a case of Tetanus by paying particular attention to the periods of increased spasm, the ability to open the jaws, and to the temperature. If after the fourth or fifth day the spasms do not increase in frequency, and the jaws do not become entirely locked, with no further increase of temperature, then we may presume the case will end favourably. But in all localities, and under every circumstance, Tetanus is a very serious complaint, and the number of recoveries are not numerous.

In our treatment of Tetanus we are necessarily very much handicapped by our inability to administer medicine, and by the animal not being able to take food. In most cases we are not called in until the patient is far gone in the disease, and from the first we see the case cannot possibly be brought through, and in these cases I, myself, think it wisest to advise the owner to have the poor beast at once slaughtered. But in those cases where we may think there is a reasonable chance of recovery, the first thing to be done is to have the animal put into a clean, dry loose box, well ventilated, but exclude as much light as possible. I generally have sacks nailed over any open windows or fissures there may be in the box; they exclude the light without impeding the ventilation—the latter, in my opinion, ought always to be carefully looked to. For bedding I prefer cut straw, when it is to be got, as an animal can move about with more freedom than he can on whole straw. When these instructions have been carried out, I always ask for the man who will attend to the patient, and give the key of the box into his possession, and inform him that he has on no account to let any one go near the animal, but himself. Some practitioners prefer the use of slings to all cases of Tetanus, but from my own experience I fail to see any benefit to be derived from them. I used to use them at one time, but do not do so now; and I have had quite as much success, if not more, since discontinuing the use of them, one reason being—and the main one—as in the case before mentioned, the slightest movement or touch upon the slings causes pain; and I think if a case is so far advanced that it is necessary to sling it, it is too far advanced for any chance of recovery.

It is always desirable to administer a dose of physic if it is possible. Very often at the commencement of a case the jaws can be partially opened and a ball given by the aid of a balling gun—very seldom we are able to give one with the hand. If I cannot give a ball I give linseed oil in mashes, which the animal very readily takes; I never had one refuse this. After the bowels have been nicely moved they can very easily be kept regular and loose by mashes, gruel, etc. In the drinking water many medicinal agents may be given. I have had most success from the use of hydrocyanic acid,

given in ʒij doses three times a day, with occasionally a ʒj of ext. belladonna. The hydrocyanic acid is more readily taken when given in hay-tea, the smell of the acid is not so appreciable as when given in water. The belladonna I smear over the molar teeth as high as I can get it. Tinct. aconite, chloroform, bromide of potassium, chloral hydrate, injectio physostigmiæ, and tinct. calabar bean have all advocates. I have not used any of these agents, with the exception of tinct. aconite, from the use of which I have seen good results, but I prefer to rely on hydrocyanic acid. In cases of Traumatic Tetanus it is always policy to dress the wound with some sedative application. I apply, when practicable, a linseed meal poultice medicated with belladonna; I also use a dressing of glycerine and belladonna—one dram belladonna to four of glycerine—and paint the wound with it three or four times a day. Blisters and skins taken from newly-killed sheep applied along the back of the patient have been advocated, but I should think this treatment would not be advisable, on account of the irritation that would be set up, and I think you will all agree with me that the quieter an animal is kept the greater chance there is of a favourable issue.

The case I have before alluded to, due to chronic Laminitis, was in a brood cart-mare, and she was due, at the time I was called to see her, to foal in six weeks; I need not say that this complicated matters. I found she had very bad feet, the toe of the pedal bone having dropped, and her soles quite convex, with the wall of the foot broken away. I had the shoes at once removed, and pared the sole as thin as I could get it; I then put her feet into bran poultices, with a good foundation of hay in the bottom of each sack, and by my orders the poultices were kept warm and moist by the attendant pouring warm water into the top of each bag four or five times a day, the poultices being changed once a day. I found the bowels were much constipated, and being unable to administer a ball on account of my inability to open her jaws more than an inch, I gave her in a sloppy mash ʒx linseed oil, and six hours after another ʒx, both of which she took very readily. I also gave her hydrocyanic acid in ʒij doses three times during the afternoon and night in hay-tea. The next day her bowels were acting as well as I could wish. I continued the same treatment for a fortnight, alternating the acid with ʒj doses of ext. belladonna, which I smeared over her molar teeth. I had no occasion to give any more linseed oil after the first day, as her bowels were never constipated again. At the end of three weeks she was so far recovered that I had her shod and turned out to grass for a couple of hours each day, and in about three weeks after that she gave birth to a fine colt foal. I was tempted to put this case in slings, but am quite satisfied she did as well without them.

I shall now, with your kind permission, draw your attention to a case of Open-joint. The patient was again a cart-horse. It received, when walking over a refuse heap, a clean deep cut, about an inch above the coronary band and exactly in front of the off hind leg. The horse went to work on the second day after receiving the wound, it appeared so slight and showed no signs of lameness, and worked for two days; on the third day I was called in, when I found the animal could not put his foot to the ground—in fact, he travelled on three legs. My diagnosis was Open-joint. I applied the usual astringent treatment, and the wound closed on the third day; but broke out again three days after, and discharged synovia copiously. I then applied a blister, which stopped the discharge for five days, when it broke out again worse than before. The case had now I considered become very serious. As I had carte-blanche to act as I liked, the owners and others, who were not by any means men of inexperience on such matters, being of opinion the case was hopeless, I determined upon a course of treatment, departing out of the usual course, which fortunately turned out a complete success. The

treatment I adopted was as follows:—I had the wound and surroundings cleaned from all discharge and foreign matter; then syringed the wound well out with a solution of Liq. Ferri Perchlor. (1 to 16), after which I introduced as far in the wound as I could get it as much Iodoform as it would take, also sprinkled some round the edges of the wound, and applied a bandage pretty tightly over the whole. For six hours the animal evinced signs of great pain, but after that the pain subsided, and next morning the patient was standing on that foot and resting the other. I left the bandage on for two days, and when I removed it I found less discharge than would cover a two-shilling piece. Thinking it well, however, to repeat the application, I again dressed and bound up the part as before, and left it so for another two days, and when I removed the bandage the wound was nearly healed. The animal trotted lame for two or three weeks after, but this I am satisfied was mere education, together with perhaps slight contraction of the tendons from resting the foot. The horse is still under my notice, and is now perfectly sound.

We are all aware, and as I have before remarked, the objects of these papers are advancement and mutual benefit, and however feebly my pen has transmitted my thoughts to paper, it has been cheerfully done, and if I have been the means in the slightest degree of adding to the general store of knowledge which we are all daily gaining, however old or young we may be, I shall be more than paid for my trouble.

I thank you, gentlemen, very kindly for the kind and attentive hearing you have given me.

The CHAIRMAN then invited discussion on Mr. Soulsby's papers.

Mr. BELL: I think we must be very much obliged indeed for the very able papers given by Mr. Soulsby. He has covered the whole ground. Cases of Tetanus vary very much indeed in their character. I have always myself been an advocate for slinging cases after a certain number of days have elapsed, because I find that once the animal gets down it is hopeless. I have often very great trouble in getting medicine into my patients. I have found the administration of chloral hydrate very successful. With respect to Open-joint, I am glad that Mr. Soulsby has tested the injection into the joint. I intend to try it on the first case that comes under my notice.

Mr. YOUNG described two cases of Open-joint, where he had been successful in treating them with a blister around the opening and painting the wound directly with Ol. caryophylli.

Mr. DAWSON thought that Open-joint had a great deal to do with the locality. I have had very great success with cold water alone; cold water continuously applied for a couple of days will stop the effusion. But it is different with the knee; the standing makes it difficult to stop, and I have very little doubt but that the applications referred to would be very beneficial.

Mr. HOWE confirmed what Mr. Dawson had said, and quoted a case he had where the animal was in a field, and the wound was washed with plenty of clean cold water and a dry bandage put on, and the wound healed very quickly.

Mr. THOMPSON: I am sure I have had very great pleasure in listening to Mr. Soulsby's two papers, as they are both very important. I think Tetanus a frightful disease, whether it be in the human or animal creation. From what I have read and seen of this disease, I think it is nearly allied to Hydrophobia. He described cases within his own recent experience, one of which was the result of a groom docking a horse's tail with a knife and mallet. I have seen a good few cases of Open-joint successfully treated with cold water. Success in the treatment of Open-joint all depends on the extent of injury done to the ligaments. With respect to Tetanus, I believe it is very rare in the bottom of pits. Injuries to the feet are common there, yet there

are few if any cases of Tetanus. I am under the impression that Tetanus is due more to the atmospheric influences than anything else.

Mr. HOWE referred to two cases where colts had been taken to be shod for the first time and docked at the same time, and they both had Tetanus as a result, and died.

Mr. CARLISLE: Docking is a very serious operation; but still, as far as my experience goes, there are as few cases of Tetanus as a result as from any other operation. The greatest number of cases result from affections in the extreme parts of the body, as the foot, nose, and tail. In cases of Tetanus, I invariably have them slung and in a quiet place, and keep them quiet and dark. In Open-joint I very often sling my patients, as there is as much need of keeping the patient quiet here as in Tetanus. Simple cases of Open-joint can easily be cured by cold water, but in other cases I don't see what effect it can have. Now and then I have had to take a hot iron; it has a capital tendency to bring about healthy action, and if you can get that, the healing process takes place very soon.

Mr. BELL and Mr. YOUNG both supported Mr. Thompson's theory that Tetanus was greatly influenced by atmospheric changes.

The CHAIRMAN: I have seen some cases of Tetanus, and my experience coincides very much with the opinions given by some of the gentlemen. I am perfectly satisfied that if you are to have successful cases, you must have slings used on most of them. You may get your animal through the early or acute stages of the disease, but he becomes exhausted from the standing. I have had frequent cause for regret for not using slings. In very acute cases, in spite of all you can do, they never reach the stage for slinging. I have seen one case where the horse became so restive in slings, that he had to be taken out, and he did very well without them. With regard to treatment, the animal ought to be fed with food that he can suck, and I will use linseed oil in the mash on the first opportunity, as advocated by Mr. Soulsby. The medicines used are various, and it is best to be guided by the condition of your patient. With regard to Open-joint, I would like to say a few words in the case of a punctured open joint. In the first and most acute inflammatory stage, irrigation with cold water is invaluable. This I have tested, and if you can get it from a hose and applied constantly, it is not only invaluable, but it is reasonable to think so. You must first reduce the inflammation of the joint, and after that is done, there is nothing better than an extensive plaster over the joint, and then sling your animal, if necessary, and keep him as quiet as possible.

Mr. CRONDACE, referring to what Mr. Thompson said about the absence of Tetanus in pits, said that he had had one recently in a coal-pit as a result of a pricked foot.

Mr. SOULSBY: As regards slinging in cases of Tetanus in horses, the last three cases that went down under my treatment were all slung, and everyone of them knocked themselves about so much from the second to the fourth day, that I thought I would never put any in slings again. I have had two since then, and both did well without the use of slings at all. I find that animals will almost take anything when suffering from Tetanus in the gruel given to them as food, and I usually administer all medicines in this manner. I do not often use hypodermic injections, as I find that the patient usually resents it, and I would sooner let them alone than have them struggling. With respect to cold water in Open-joint, I have tried that in a number of cases, and at the second or third day it is very often stopped. You must get the germs of the disease killed or otherwise done away, before you can stop the discharge.

Professor Williams here came into the room, and the Chairman explained the position of the discussion, and invited him to give the members any information on the subjects touched upon that he would.

Professor WILLIAMS; With respect to Tetanus, it was a common ailment in the neighbourhood of Edinburgh particularly. My practice, as to well-marked cases, is to put them into slings quickly in a dark place, before the disease arrived at its greatest intensity. You may get the horse used to slings before the spasms are severe, and he was not thrown into convulsions, as he would be if the slings were kept away. Putting the horse into a dark place prevented the horse being tormented by flies. He then described his medicinal treatment. Tetanus is a disease which requires at least a month for recovery in the most favourable cases, other cases six weeks or two months. Medicine was only of good in the case of relaxing the system. No medicine has the power of cutting short the disease, only by causing relaxation when the animal is in extreme danger of suffocation. In France cocaine had been injected into the muscles of the face, and a case had been recorded where recovery had taken place in a couple of days. But I could not believe that to be a true case of Tetanus. The treatment has greatly improved lately, for every one saved in the past, five or six recovered now, and nothing will excel the use of belladonna and atropia, with quietness. With regard to Open-joint, I read a short paper at Newcastle, and since then I have had other cases not there referred to. I have treated cases by antiseptic surgery that were well in three days, which by any other treatment would have required a couple of months. By applying antiseptic surgery we may prevent the germs getting into the joints, and the repairing process will go on at once.

MR. BELL moved a hearty vote of thanks to Mr. Soulsby, which was carried unanimously; and Mr. SOULSBY moved a vote of thanks to the Chairman, which was also carried unanimously. This terminated the meeting.

JOHN ARMSTRONG, *Hon. Sec.*

YORKSHIRE VETERINARY SOCIETY.

THE last quarterly meeting of the year was held at the Queen's Hotel, Leeds, on the 28th October, the President, Mr. G. W. Carter, in the chair. The following members were also present, viz., Prof. J. W. Axe, Messrs. T. Greaves, Anderton, J. M. Axe, Atcherley, G. Bowman, Jos. Carter, Deighton, Greenhalgh, Hardie, Lodge, Pratt, Pickering, Scriven, Geo. Schofield, Snarry, Mason, Chambers, Robinson, Briggs, Hanson, Smith, Whitehead, and the Secretary. Mr. W. J. Fletcher, F.R.C.V.S., Sheffield, and Dr. Green, Leeds, were present as visitors.

Excuses for non-attendance were received from Prof. Williams, Messrs. E. C. Dray, Cooper, Danby, Bale, and P. Carter.

The minutes of the last meeting were read and confirmed.

Mr. Jas. Thornton, F.R.C.V.S., Thirsk, was proposed by the PRESIDENT, and seconded by Mr. BROUGHTON.—Carried.

Mr. Joe Clarkson, M.R.C.V.S., Apperley Bridge, was proposed by Mr. SCRIVEN, and seconded by Mr. ANDERTON.—Carried.

Mr. DEIGHTON, Riccall, called the attention of the members to an outbreak occurring among calves on a farm. The animals affected were nearly without exception well-bred bull calves from four to fifteen months old; the symptoms very much resembled those of Rheumatism, the swellings occurring especially in the shoulder, knee, and stifle, the animal evincing great pain when moved. It was a rule on the farm that each calf should suck its mother up to three months, after which the food consisted of turnips, rice, chopped straw, etc. Treatment seemed to have no effect.

Mr. TOOP remembered a similar outbreak, and had exhibited the salicylate of soda with success, and the application of blisters.

Prof. AXE thought that the outbreak needed considerable care in coming to

a correct conclusion as to what was the disease, and also the cause, and suggested that a committee should be appointed by the Society to meet Mr. Deighton, and investigate in detail the whole circumstances on the spot, and to report their decision to a subsequent meeting.

Mr. GREAVES had seen a similar outbreak in calves, and thought that it was due to the feeding or lead-poisoning.

Mr. BROUGHTON moved, and Mr. GREENHALGH seconded, that a deputation, consisting of the President, Prof. Axe, Messrs. Briggs, Toop, and Hardie should be appointed to meet Mr. Deighton and report on the matter. This motion was adopted.

Professor AXE then delivered a lecture on the cow in relation to Scarlatina of man.

The lecturer first drew the attention of the meeting to milk as a vehicle by which fevers were disseminated, pointing out how frequently this fluid had in recent years been found to bear the contagium of such ailments, as Scarlatina, Diphtheria, and Typhoid Fever into the dwellings of all classes of people, and to occasion widespread sickness and mortality.

Recently, he remarked, epidemiologists had endeavoured to show that not only was the produce of the cow a medium for the conveyance of specific infection, but that so far as concerned Scarlatina the cow herself was capable of incubating and giving out the virus of the disease.

This idea had been put forward on several occasions as a possible explanation of fever outbreaks, but it had only recently been alleged to have actually occurred.

The Professor then referred to an outbreak of Scarlet Fever in the north-west district of London, which had been attributed by Mr. Power, of the Local Government Board, to an eruptive disease on the teats of a herd of cows located on a dairy farm at Hendon.

The details of this case were fully described and commented upon.

Professor Axe then followed step by step the investigations undertaken by Dr. Klein into the nature of the Hendon cow disease, and its bearing on the general question of Scarlatina as a cow malady.

The more recent researches of Dr. Edington, of Edinburgh, into the nature of the contagium of Scarlatina were then related, and the discrepancies between the results obtained by that gentleman and Dr. Klein were pointed out.

A full report of this lecture will be published later on.

After the reading of the essay a discussion took place as to the nature of the disease affecting the cows in question.

Messrs. ANDERTON, B. SMITH, and GEO. SCHOFIELD were of opinion that the disease was Cow-pox; they had never known analogous symptoms produced as those described by Prof. Axe.

Mr. BROUGHTON thought it was not at all clear as to the nature of the malady, and thought it might be a mild form of Eczema developed *in transitu* between the Midlands and London.

A unanimous vote thanks was accorded to Prof. Axe for his most interesting lecture.

The Treasurer read his financial statement, balance in hand £61 9s. 5d., which was adopted, on the motion of Mr. TOOP, seconded by Mr. SCHOFIELD.

Election of officers for 1888 then took place, Mr. Philip Deighton being proposed by Mr. GREAVES as President, seconded by Mr. SCRIVEN; carried unanimously.

The ex-President, Mr. Geo. Carter, W. Lodge, and G. Hardie were elected Vice-Presidents; the Secretary and Treasurer were re-elected.

A cordial vote of thanks was given to Mr. Carter for his efficient services in the chair, to which he suitably replied.

THE CENTRAL VETERINARY MEDICAL SOCIETY.

THE first general meeting of this Society was held at the First Avenue Hotel, Holborn, on Thursday, Nov. 3rd, 1887.

Present:—Charles Sheather, Esq., President (in the chair); Dr. Fleming, C.B., Sir Henry Simpson, Professors Pritchard and Shave, Messrs. Broad (3), Cheeseman, Chesterman, Elworthy, Gibbings, Hall-Brown, Harrison, Herron, Hunting, Lowe, Oatway, Overed, Roots, Rowe, Samson, Sewell, J. F. Simpson, Woodger, Wragg, and the Secretary. A. Hill, Esq., Secretary of the Royal College of Veterinary Surgeons, and six other gentleman were present as visitors.

Apologies for non-attendance were received from Professors Axe, Penberthy, and Walley; from Messrs. Banham, Caton, Roalfe Cox, Mulvey, Moore, Price, Rickards, Roberts, Slocock, Fred Smith, A.V.D., South (2), and H. Withers; a telegram was received from Professor Pritchard, who, being detained in the country, was not able to join the meeting until later in the evening.

The SECRETARY read the minutes of the last meeting, and the PRESIDENT, in delivering an address inaugurating his term of office, thanked the Society for electing him to his present position, and expressed the pleasure which he felt in accepting the office. He said that he had already been promised by several gentlemen an almost sufficient number of papers to satisfy the requirements of the coming session.

The Society, according to its rules, was constituted for the purpose of advancing veterinary science in general. The advancement of the science necessitated that the individuals who practised the science should be themselves advancing. There was no space for retrogression, and the Society must not stand still. Men who had entered practice must cultivate habits of close observation, and students and pupils who were hereafter to become veterinary surgeons should have the best education, general and professional, which it was possible to afford them. As to science, it proceeded very rapidly nowadays, and students should have a thorough acquaintance with it in all its branches affecting veterinary matters; but, as well as that, they ought to have a thorough practical understanding of the duties which they would be required to perform in the course of the practice of their profession. A great difficulty has been felt at the present time in deciding in what way these objects could be best accomplished. He thought that nothing could be more inimical to the best interests of the profession in a matter of this kind, than to rest in an uncertain or chaotic state. If rules were made for the education of students at one moment and then, very shortly afterwards, altered and cut about till the original plan was almost lost, a deal of unpleasantness would be created among the members of the profession, and the public would lose confidence in our ability to manage our own affairs. Besides this, students would not know what they would have to do, and the parents of students would not know how their sons ought to be prepared for their professional studies. Upon the whole, a very disquieting effect would be produced if sound fundamental principles be not adopted. As the matter was now being taken in hand, he thought that it ought to be effectually settled, and that whatever was decided upon should be adhered to. This was most important, even if the best scheme were not adopted.

There were many qualifications needed in a youth who intended to follow the veterinary profession. First of all, he must know something about animals; this was a necessity, although it was not commonly recognised. The leaning

and yearning of the veterinary student ought to be towards animals. In the next place, the student ought to have a good general education—a better education than the student of the present and of the past has had. This was very essential. To attain what he considered to be the necessary general education, the student must have intelligence. Without this he could never succeed in his profession; and the value of the test of general education was much overlooked in estimating ability and probable success. Beyond a good general education, he needed physical and mental abilities out of the common order. He needed a frame which would withstand fatigue and long hours, while he needed also an accurate perception, with ability to observe and remember small matters, such as the general run of life did not demand. In addition to these qualifications, the student required a special training, both scientific and practical, for the profession which he was to follow. A great deal of misunderstanding seemed to exist with regard to that point, and persons divorced the scientific from the practical. The good practitioner carried his science into practice—he made use of the drill, learned in peace in the prosecution of his war against disease. In practice one met with the so-called thoroughly practical men who discarded and neglected to apply all that they had learnt, and went on by the rule of thumb to the end of their days. The older such men got, the smaller became their experience, for they never tried to observe anything fresh. They simply went on doing what had been done before them, resolutely resisting innovations. The great aim nowadays should be to instill into the young practitioner the necessity of cultivating all the sciences that were connected intimately with his profession and bringing them into daily practice. This could be done and had been done, and he saw no reason whatever why practice and theory, as it was called, but more correctly practice and science, should be divorced.

There was, however, great difficulty in attaining this result. There was a great deal of difference of opinion as to whether a young man should see practical work first or go to college first and receive a scientific education. Upon that point he entertained some strong opinions, but he believed that his observations bore out their justice. If a period of inactivity were allowed between the time a student left school and the time he entered college, he contracted slothful habits, as a rule, though he did so unconsciously; when his mind ought to be most active and prepared for receiving more knowledge, he slowly drifted back and got rusty. Therefore he believed that one of the best things that could be done was to put a youth as a pupil with a veterinary surgeon, so that his time might be filled up and he might be rendered active, for mental capacities improve with exercise as much as physical. At the same time, the pupil would acquire a large amount of knowledge (not always purely professional) which would be useful to him in future life and benefit him. He believed that the youth should then pass to a school and be educated there in the best possible manner. Upon the subject of the education at the schools, he (the President) had his own ideas. He passed through one of the schools about ten years ago, and his recollections were very bright about what happened then. He had had occasion to observe how students pass through the schools at the present time. His opinion was that, during twenty-two months' actual study at the present time, only as much, if as much, knowledge was got into the mind of the student as was got into it in fourteen months' actual study when he was himself a student. There was not the same amount of energy and zeal in the students themselves. The great fault was the doling out of the knowledge to them in spoonfuls. A man had chemistry, botany, and some other simple allied subjects to study, and possibly a little anatomy in the first six months. He found that the work was very easy-going and that he had little to do. He would read three subjects for the first month with a little zest, and he would

get on pretty well, but the continual working at them would cause him to get tired of them long before his six months were over. If he had two additional subjects, he would turn to them as a relief from the other three, and he would get on much faster in consequence of being able to change his attention, and not have his mind palled by continual application to a small number of subjects. He (the President) was sure that a great deal of misfortune which had befallen the students of late in their endeavours to pass the examination, was less due to themselves than to the system. He believed that getting a diploma in three grades or steps was a mistake. He thought that the students ought to be able to get it in two examinations, for if they had more subjects to be examined in at one time they would get through much better than they did at present, owing to their feeling the pressure and necessity to study more; as it is, they under-estimate their work and attack it leisurely. If a student was particularly good in his first session, he would get the first subjects at his fingers' ends; but by the time he got to his third session those subjects would be almost obliterated from his mind, and, having received the knowledge in three doles, he would not be able to make use of it or associate it with his other studies, and utilise them as one harmonious whole in his subsequent practice. A boy at school worked six or seven hours a day; a student at college worked three hours and loafed and smoked the rest of the time, and yet expected to pass his examination. There was nothing to compel the students to work. The tutorial system was undoubtedly the best if it could be carried out—in fact, the schoolmaster was still wanted. If a boy of sixteen were allowed the liberty of a man of thirty, he would be thirty in his less industrious habits before he was twenty-one. The weakness of the present veterinary student was attributable in a great measure to the present system and the absolute absence of private classes. He (the President) knew of no better place for a man to gain knowledge than a private class held out of college hours. In private classes the student got accustomed to question and answer, and his dignity was touched if he were asked questions which he ought to have been able to answer, but could not do so; and this led him very soon to obtain the information. But students in the college listened to lectures which passed in at one ear and out at the other—mechanically listening, but imillumined with the necessary intellectual spirit. He thought that it was one of the greatest mistakes that the private class system should have disappeared. No doubt parents would think that private classes were unnecessary expenses—that their existence implied that the actual college instruction was short of its requirements—but he believed that that was a mistaken idea. It was better to work a student harder and keep him at the college a shorter time than to allow him to waste his time in taking two or three lectures a day and wandering aimlessly about the rest of the time, feeling an absurd security in his ability to master the subjects for the next examination, on account of their very paucity. He believed that it was never more needed than at the present time that the whole profession should give their support to the examining board, because, if the bar which is to be leaped before the student could enter the profession was lowered, the profession as a whole would suffer. The bar should be fixed higher, rather than lower. The standard of education should be raised. He did not think that it had been raised in the last ten years, or that the students were any further forward, considering the time they were studying. Instead of being splendid physiologists, excellent botanists, and thorough histologists and anatomists, he believed they were no better than they were when they had only fourteen months' actual study, and the reason was simply that pressure was not put on, and there was not the same inducement to get through that there was formerly, for, feeling that the curriculum was a long one, they

set about the studies with less energy and determination. If there was a difficulty about education at the college, one remedy was to increase the teaching staff. He believed that the colleges were somewhat overtaxed with regard to the number of pupils. Those who had not the energy to work for themselves got left behind and kept accumulating, and every extra examination introduced would tend to increase the accumulation, not relieve it. The good men always went through, whether they were properly taught or not; but those who formed the rank and file clogged the colleges with a band of rejected students of all grades, thus increasing their teacher's difficulties and decreasing their own chances of passing. There might be some improvements needed at the examination tables, but these might fairly be left to the Council, who know much more about it than the general profession could do. He thought that a written examination might be added to the oral examination with advantage, but the persons who prepared the papers for it must know something about what a written examination was. According to his (the President's) own experience, the time allowed for answering the questions was not sufficient. When he competed for the Fitzwygram prize, there were nine or more questions set on a certain subject, and only three hours allowed for answering them. One of these questions embraced "Laminitis," while in the competition for the Coleman medal that question constituted the sole one, and three hours (none too much) was allowed for it. If the examiner had sat down and tried to answer the questions himself, he would have found how impossible it would be for the student to answer them in the time. The student who had paid great attention to the subjects would go on the principle that a little well done was better than a large quantity scamped; while a student who had only a superficial knowledge would attempt all the questions and get the marks. In such a case the examiner would not know which was the best man, as he would in all probability construe that the man who laboured on the few questions did so because he knew little about the others. As to the oral examination, there was not much to be said against it, for it took place in an open manner, and one examiner could see what another was doing. One improvement, however, which he would suggest was that, when a student went into the examination room and took his place at a table, his mind should be directed to the subject upon which he was about to be examined. It would be useful to the student for the examiner to preface his questions by saying, "I am going to examine you in physiology," and it would do no harm if the examiner were further to narrow the compass and inform the student as to what portion of physiology he was going to deal with. In this way the student's mind would be directed to the subjects at once, and there would not be so many wild answers. If this were not done, the student might be unnerved and give the examiner a bad impression. He believed it to be a mistake to separate the practical examination from the scientific examination. Under such a system it might come about that a man's veterinary education would occupy many years of petty steps. The students required more tutorial education than they were getting at the present time. Young men of seventeen required to be under more control than the present system afforded. He (the President) had nothing more to add on this occasion. If he had not given the members of the Society a very satisfactory opening address, he had nevertheless put before them something to think about, and something to occupy them until the time arrived for the more pleasant occupation of dining. He must thank them for the kind attention which they had given to him.

Dr. FLEMING proposed, and Sir HENRY SIMPSON seconded, a vote of thanks to the President for his address, which was carried with acclamation. The PRESIDENT briefly responded, and the company adjourned to the "Windsor Room" for the annual dinner.

SIDNEY VILLAR, *Hon. Sec.*

Obituary.

The Secretary of the Royal College of Veterinary Surgeons reports the demise of the following members of the profession:—

Philip Wishart, Haddington, graduated...		...	...	...	1844
Alex. Robertson, Stonehaven	„	...	...	...	1844
William J. Johns, London	„	...	...	...	1856
Frederick Keal, late Liverpool	„	...	...	...	1868
John Dickson, Lennoxtown, Stirling, graduated			...	...	1873

Notes and News.

CONTAGIOUS PLEURO-PNEUMONIA IN GOATS.—A very interesting note on the subject of lung disease among goats is given in a recently published consular report from Morocco. In the interior of that country goats form the staple part of the agricultural wealth of the rural and nomadic population, and among these a virulent form of lung disease, called "Bayoor," is very prevalent. The principal symptoms of this disease, which is said not to attack sheep, but only goats, are stated to be that the hair drops off, the animal rapidly sickens, death ensues in two or three days, and the lungs, if a *post-mortem* examination be made, are found to be much enlarged and black. A curious kind of inoculation, said to be remarkably efficacious, is practised by a nomad tribe of Arabs called the Towbalt, great goat breeders, many of whom are found in the interior, and some in the vicinity of the seaports. It is stated that on the appearance of the "Bayoor" among their flocks, a portion of the diseased lung is taken from an animal that has died of the disease, and the other goats are inoculated each with a small piece. A slit is made in the ear, the bit of lung placed in it, and a slight cautery applied. Animals so treated are said not to be liable to the disease. It is stated that last year, while their neighbours lost hundreds of goats, the Towbalt saved nearly all theirs.

PROTECTIVE INOCULATION FOR HYDROPHOBIA.—The *Times* correspondent at Vienna, writing a review of the proceedings at the International Hygienic Congress (recently held in that city), states that the evidence of Dr. Ullman, assistant to Professor Albert, of Vienna, was strongly in favour of the Pasteur treatment for persons bitten by mad dogs. Dr. Ullman during the last year treated 122 persons. Only three died, or an average of 2·4 per cent. The mortality among persons bitten, and not treated, is estimated by various authorities at from 5 to 30 per cent. One instance—quoted by Dr. Ullman as having come under his own notice—is so cogent that it should be universally known. In a Polish town a mad dog bit five persons. Three submitted to the Pasteur treatment, and two refused. The two have died of Hydrophobia, and the three are all living. Dr. Bardoni, of Turin, and Professor Metschaniteoff, of Odessa, gave very similar testimony.

THE VETERINARY PROFESSION.—The *Live Stock Journal* of October 28th has the following:—In certain districts it has hitherto been the custom to look down upon the well-educated and well-instructed young veterinary surgeon as little better than the old-fashioned cow-doctor or farrier. Just now the veterinary colleges open for the full session, and it behoves us to say that, with the increased importance attached to live stock and horses in this country, the young veterinary surgeon who holds his diploma can, if he likes, take up a dignified position. There is no profession in England which holds such an important general charge, and it is satisfactory to notice the gradual disposition to accord to the veterinary surgeon the same place of trust and

confidence which is at present placed in the clergyman and the doctor. These are satisfactory signs of the times.

TANACETIC RABIES.—In continuing his researches on Tanacetic Rabies, M. Peyraud read a paper before the Academy of Sciences last week on the preventive action of the hydrate of chloral on this artificial malady and true Rabies. He instituted two series of experiments on rabbits and birds by intravenous injections with the essence of tanaisia, followed by the subcutaneous injections of chloral. In the first case after having produced the specific symptoms, he endeavoured to arrest their development by the subcutaneous injections of chloral, and it was thus remarked that when the tanacetic convulsions were established, the arrest of the malady did not take place. If, on the contrary, the animals were previously subjected to the action of chloral, and when they fell asleep or were simply drowsy, and a certain dose of the essence of tanaisia was administered, the convulsive effects were not produced, or were produced tardily, and after repeated doses of this essence, when the quantity of chloral was insufficient. From this result the author concludes that if the chloral had not a *curative* action on Tanacetic Rabies, it evidently had a *preventive* action. The discoveries of M. Pasteur on experimental Rabies gave M. Peyraud the idea of studying the two kinds of Rabies comparatively, and his experiments led to the following results: "On the 6th of March, 1887, I inoculated a large black rabbit by the submeningeal method, the rabic virus being taken from a man named Berger, who died six months after the Pasteurian vaccination, of Paralytic Rabies, in Dr. Pitres' ward. This virus was of the third series of inoculation of rabbits. The Paralytic Rabies of the preceding series always reached the fifteenth day. Six others (*temoins*) were at the same time inoculated with the same virus. All six died from Paralytic Rabies six months ago, but the black rabbit is still living. It manifested only a slight weakness about the sixteenth day of the inoculation. The rabbit was treated in the following manner: "On the 10th, 11th, and 12th March it was placed under a bell-glass, and subjected during two hours and a half to the action of the fumes of chloral, without its falling asleep. On the 13th, 14th, 15th, 16th, 17th, 18th, and 19th March the animal was injected subcutaneously with 10, 20, and 30 centigrammes of a solution of chloral (2 grammes to 250 grammes of water). The treatment lasted ten days, since which time it has not presented any morbid phenomenon, and it is probable that it will not become rabid, as it is now more than seven months since it was inoculated."

AGE OF ANIMALS.—A notice lately appeared of the death of a brown water spaniel at the age of twenty-eight years. She had belonged to the same owner from a puppy, and died literally of "sheer old age." A few months before, a cat died at the age of twenty-two years and two months. These are very unusual ages, though it is probable that some individuals have lived still longer. Herbivorous animals are generally thought to outlive carnivorous ones; and of the former class those dedicated to labour appear to furnish the largest number of instances of longevity. Two years ago a donkey died at Cromarty that was known to be at least 106 years old. It could be traced back to the year 1779, when, at an unknown age, it came into the hands of the then Ross of Cromarty; and it lived in the same family, "hale and hearty," until a kick from a horse ended its career. No horse is known to have attained to anything like such an age as this; but a few have lived to ages varying from forty to fifty years. A famous old barge-horse died at Warrington in his sixty-second year; and the oldest horse known in New York was, until quite recently, doing steady work there at thirty-eight years of age. A few months ago, also, a mule forty-six years old died at Philadelphia. Of all aged animals, the horse and the dog appeal most

nearly to human sympathies. It is not merely that they have been our faithful servants and friends, but there is a gravity, and almost a dignity in their bearing which is very touching. Many agencies are now at work for teaching the policy as well as the duty of kindness to animals; and of these, the sight of an old servitor loyally bestowed in paddock or kennel is not the least instructive. Nor need a charge of this kind be without profit. The care of our four-footed friends in their declining years may furnish many valuable hints for the treatment of their still serviceable fellows.—*Live Stock Journal.*

SPRATT'S FOOD.—The Australian mail just to hand gives particulars of the awards at the Adelaide International Exhibition, by which we see that Spratt's Patent Limited, as usual, have obtained the premier position, receiving the highest award. The Saltaire Exhibition just closed have also awarded this company a gold medal for their unique exhibits of dog, poultry, and game houses and appliances.

THE CANCER BACILLUS.—It is announced from Berlin that the cancer bacillus was discovered by Dr. Scheuerlen in the laboratory of the Charité Hospital there. The existence of the bacillus, which is oviform, has long been maintained as a theory, but this is the first occasion on which it has been identified.

SWINE FEVER IN DENMARK.—This disease which has been prevalent around Copenhagen lately, has now, in spite of the most energetic precautions immediately adopted by the Danish Government, spread to other parts of the kingdom. A decree has been issued prohibiting the sale of pigs at fairs and markets.

Correspondence.

THE POLE-AXE IN PLEURO-PNEUMONIA *VERSUS* INOCULATION.

SIR,—Our inoculating friends keep coming forward and reiterating the extraordinary claims in favour of inoculation. I think it is only fair that the pole-axe and stamping out system should have its say, in order that we may see both sides of the question, and show how experiences differ. They claim to have only killed twenty-seven animals in six outbreaks. This is not a fair way to look at statistics, for in my experience it is as easy in recent outbreaks to stamp out Pleuro-pneumonia in a herd of twenty or more as it is in five. So those who are favoured with experience in large herds will have by the inoculator's mode of showing statistics more favourable figures, but, on the other hand, it is not the percentage we have saved we should look at; it is the percentage we have killed in order to stamp it out in recent outbreaks. They claim only to have killed twenty-seven animals in six outbreaks, "and these were slaughtered from time to time as they occurred," thus giving an average of $4\frac{1}{2}$ to each outbreak.

In the last eleven outbreaks under my own observation, twenty-three animals were killed before we had it stamped out, giving an average of a little over two in each outbreak, and these outbreaks occurred in herds from three to twenty-one. So if we continue to keep Pleuro-pneumonia in check with as good results, there will be no necessity for us to resort to "wholesale slaughter, inoculation, inhumanity, waste of public money, or the sloat." Although our farms are small, and close together, having nearly 2,000 dairies in this parish (outside the borough), only once have I known Pleuro-pneumonia in a period of fifteen years conveyed from one farm to another. If I

understand the preliminaries of the inoculators, every means are taken to stamp out the disease by having all "plainly diseased" animals slaughtered. This is followed by a very haphazard system of condemning more, namely, "those brought to light by the thermometer, to share the same fate." I pity those poor animals whose slaughter or otherwise depends on the movement of mercury in a glass tube, an instrument only calculated to give degrees of temperature. It seems to me there is a greater latitude given them than is given to inspectors generally. There can be no two opinions that it is a very effectual method of stamping out the disease, and to my mind herein lies the whole secret and success of inoculation, a clear bill of health before operating. Our system is early reporting, early diagnosing, and prompt action. Where these measures are speedily and strictly carried out, we have little trouble in dealing with the disease as I have stated, and we feel satisfied that we are doing "our duty according to our light."

Halifax. PARLANE M. WALKER, M.R.C.V.S.

OUR POET LAUREATE.

DEAR Mr. Editor, fie, fie, for shame!
If this be a joke of yours, yours be the blame.
The doggerel you published in this month's Review
May be clever as nonsense—unworthy of you.
By your talent the "Journal" was brought to the fore:
An annal of science, what could you wish more?
Its readers *en masse* by right interfere,
Urging dry rubbish may not be shot here;
Of course *you* composed it, in harmless pretence
And assigned it in jest to a man of sound sense,
Who will no doubt forgive you, best hearted of men,
For no one believes it was born of his pen.
Do say 'tis a joke, for the thing has amazed,
And people are crying that somebody's crazed;
Do say in your next, is it he? is it you?
As the question is clamouring, Which of the two?

Nov. 15th, 1887. "A READER."

DEAR SIR,—In a notice of a book of veterinary poetry, you quote some very affecting lines with regard to a lion which had a cruel thorn in its foot—

"A lion in its foot did get
A cruel thorn, which made it *sweat*
And hobble very sore."

Now, sir, I wish to ask whether members of the lion family ever sweat? I am inclined to think that the sudoriferous glands in the skin of these magnificent beasts are very imperfectly developed, and therefore to see a lion in a sweat is what no one ever witnessed. But perhaps the allusion was only poetical licence by an unlicensed poet. "ZOOTOMIST."

[In answer to "A Reader," we beg to state that we are not the authors of the poems referred to. When we are attacked by the "divine afflatus," and have produced something, if it must be shown to friends it never gets beyond MS. Nearly always the housewife converts the latter into pipe lighters.

In reply to "Zootomist," we are sorry we cannot enlighten him as to the

perspiratory apparatus of the lion; but we venture to point out to him that he has misquoted the lines: the word is "fret," not "sweat." *Hobbling* may cause an animal (even man) to fret, and under certain circumstances also to sweat, if there is any apparatus to produce the latter.—ED.]

ADVERTISING.

SIR,—The enclosed advertisement appears in *The Isle of Man Times* for Saturday, November 5th, and as I happen to have been in practice in Douglas for about five years, I have certain misgivings that this announcement may perhaps be a breach of what has been written and spoken about so much lately as veterinary etiquette. I therefore send it to you for an expression of opinion.

Would a new chimney-sweep proclaim his advent by declaring that no one could clean a flue but himself, I wonder? WM. R. DAVIS, M.R.C.V.S.

Douglas, *November 12th*, 1887.

"VETERINARY SURGEON.—On the pressing solicitation of many friends who have informed me of the widespread feeling existing among owners of horses, that a thoroughly practical VETERINARY SURGEON is urgently needed in the Isle of Man, I have determined to COMMENCE BUSINESS in Douglas. I am a fully qualified member of the Royal College of Veterinary Surgeons, and Fellow of the Edinburgh Veterinary Medical Society, and for upwards of six years have been with Mr. Tedbar Hopkin, F.R.C.V.S., of Manchester, besides having had practice in various parts of England and Scotland. Any lame or sick horses, cattle, or dogs entrusted to my care, will receive strict attention and be treated in the most approved manner. Any message will be received for me at Messrs. Kelly and Gawnes' Livery Stables, Athol-street; or at Mr. Clarke's, 4, Mona-terrace, Finch-road, Douglas. Hoping to receive your patronage, and assuring you of every effort on my part to give entire satisfaction.—I am, respectfully yours, ——, M.R.C.V.S."

MEETINGS OF SOCIETIES.

The quarterly meeting of the Lancashire Veterinary Medical Association will be held at the Blackfriars Hotel, Manchester, on Tuesday, December 3rd, when a Paper will be read by Dr. Dreschfeld on "Experimental Investigations on the Cause of Malignant Endocarditis." Tea at 5 p.m.; business at 6 p.m.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from J. A. Nunn, A.V.D., South Africa; W. Cox, Newcastle-on-Tyne; W. Williams, Edinburgh; J. McCall, Glasgow; A. Leather, Liverpool; H. Leeney, East Grinstead; Fred. Smith, A.V.D., Aldershot; S. M. Wilson, Aldershot; W. Mason, Gainsborough; J. Armstrong, Penrith; P. Walker, Halifax; W. Broughton, Leeds; W. Davies, Isle of Man; F. L. Gooch, Stamford; S. Villars, London; "A Reader"; "Zootomist."

BOOKS AND PAMPHLETS: *M. H. Hayes*, Soundness and Age of Horses; *J. Cockram*, The Horse in Sickness and How to Treat Him; *C. W. Mansell Moullin*, Sprains, their Consequences and Treatment; *H. Lee*, On the *Tapetum Lucidum*, and the Functions of the Fourth Pair of Nerves; Veterinary Reports on Some Diseases of Stock found in Victoria.

JOURNALS, ETC.: *St. James's Gazette*; *Journal of the Royal Agricultural Society of England*; *Annales de Méd. Vétérinaire*; *Echo Vétérinaire*; *Lancet*; *Journal de Méd. Vétérinaire*; *Wochenschrift f. Thiermedicin und Viehzucht*; *Hufschmied*; *Mark LaneExpress*; *Recueil de Méd. Vétérinaire*; *British Medical Journal*; *American Veterinary Review*; *Live Stock Journal*; *Edinburgh Medical Journal*; *Thierarzt*; *American Live Stock Journal*; *Journal of the Agricultural Society of Victoria*; *London Medical Record*.

NEWSPAPERS: *Nebraska Farmer*; *Scotsman*; *York Herald*; *Leeds Mercury*.